

**MUSCLE SHOALS RESERVATION  
COMPLEX D CONSOLIDATION  
ENVIRONMENTAL ASSESSMENT**  
Colbert County, Alabama

**Prepared by:**

TENNESSEE VALLEY AUTHORITY  
Knoxville Tennessee

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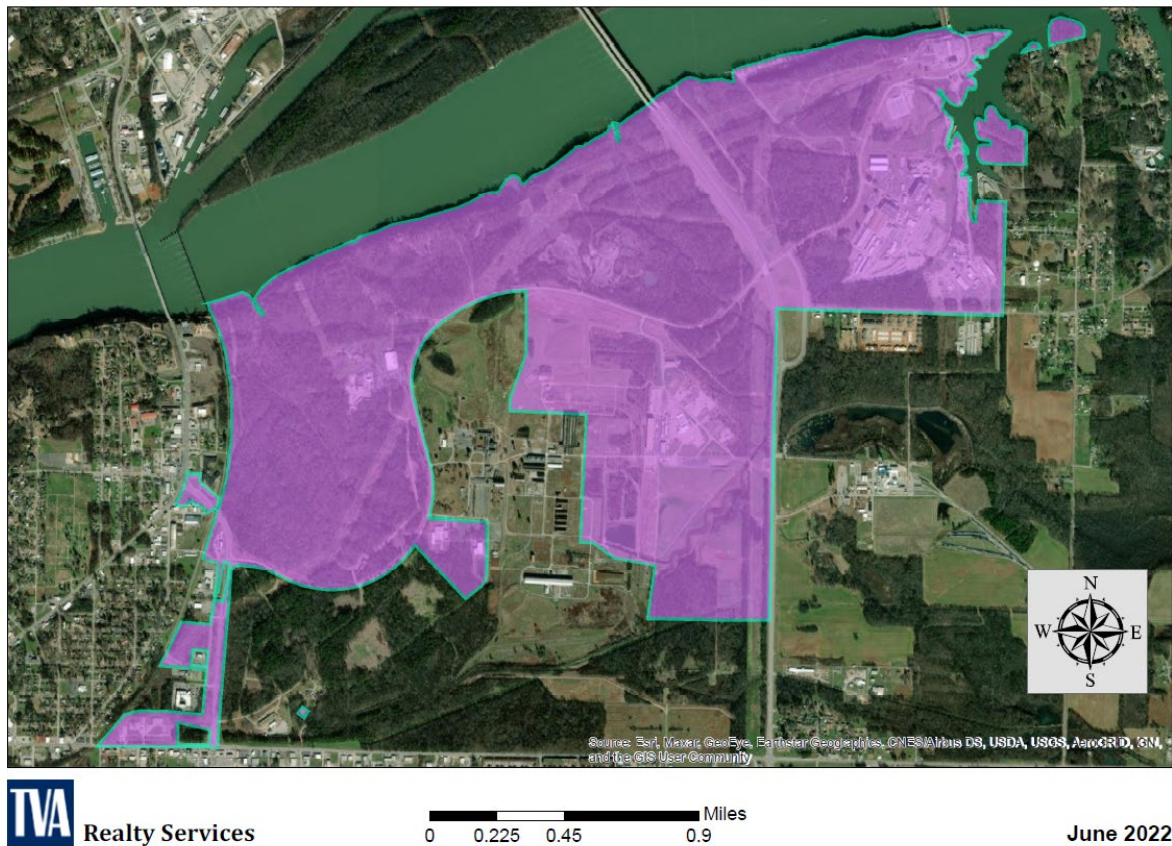
**Background**

In 1933, the Tennessee Valley Authority (TVA) assumed custody and control of 3,036 acres of property in Colbert County, Alabama, along the shores of the Tennessee River (Figure 1). Within this tract, the TVA has managed approximately 2,600 acres of non-reservoir property known as the Muscle Shoals Reservation (MSR). Through the years, the use and need for this large tract of land has changed in accordance with changes in TVA programs. TVA Board of Directors declared property on the reservation to be surplus in 2012. In 2014, the redevelopment plan was implemented as part of the *Strategic Real Estate Plan* (SREP) with the objectives of aligning the portfolio with TVA's strategic direction, rightsizing and reducing the footprint along with corresponding operating costs, centralizing real estate decisions, and creating economic development opportunities. TVA had concluded that the reduction in the size of the MSR would have positive impacts on the local economy, while reducing TVA's operational costs and maintenance. As of June 2022, the MSR has since been reduced to 1,840 acres (Figure 1), to optimize operational efficiency and pursue the fulfillment of strategic real estate management goals. Within the MSR is an area known as Complex D, which is a grouping of buildings utilized primarily for equipment storage, and office and warehouse space (Figure 2).

**Purpose and Need**

TVA's purpose and need for the proposed action is to modernize, optimize, and consolidate facility operations at the MSR within Complex D. The removal and consolidation of multiple inefficient and deteriorating buildings into one facility would reduce maintenance and operational costs, while improving working conditions, overall functionality for traffic and pedestrian traffic flow, and allow for necessary upgrades to aged utilities. Additional benefits of this proposed action are to consolidate functions inside the secure footprints of the new buildings and to eliminate numerous safety and environmental hazards along with building code concerns that currently occur within the existing buildings. In an ongoing Valley wide effort to optimize and update core TVA facilities, TVA is proposing the replacement or relocation of several building structures on the TVA MSR at Complex D and exploring the opportunity to replace the use of certain structures with new facilities that are better designed to meet current and future resource needs, energy efficiency goals, and regulatory requirements. This proposed reduction in administrative space supports TVA's SREP and the ability to align business goals; to reduce Operation & Maintenance (O&M) expenses, right-size TVA's building portfolio, and reduce capital expenditures, while providing economic development opportunities for the local community.

## Muscle Shoals 1840 Acres Fee-Owned Lands



**Figure 1. Map of the Muscle Shoals Reservation**

### Decision to be Made

TVA must decide whether to relocate essential operations into a newly constructed facility within Complex D or to modify and update the existing facilities. TVA's decision would consider factors such as potential environmental impacts, economics, availability of resources and TVA's long-term goals. This Environmental Assessment (EA) is being prepared to support the decision-making process and determine whether an Environmental Impact Statement (EIS) should be pursued.

### Proposed Action

All work described within this section is set to take place within the outlined area shown in Figure 2, which will throughout this document, be referred to as the Project Area. TVA is proposing to consolidate personnel and functions from a variety of MSR Complex D buildings into one newly constructed building, as illustrated in Figure 3. TVA determined work process efficiencies could be achieved by consolidating similar functions in one physical location. The original MSR Complex D buildings would be managed as described below. The proposed actions would take place within the Project Area of approximately 34 acres that make up Complex D. The proposed newly constructed Warehouse Maintenance Building (WMB) building would be approximately 240 feet long by 71 feet wide by 20 feet in height and be used for general facility operations. Connected actions include the addition of an Enclosed Storage Building (ESB), reconfiguration of on-site Complex D roads, the

installation of new underground on-site utility lines, perimeter fencing, and parking lot lighting. Two existing exterior shed structures attached to the Office Service Warehouse (OSW) would be demolished and replaced with a single 140-foot-long by 30-foot-wide ESB. Existing moveable storage structures including the Muscle Shoals Boat Storage Building (MSBSB) and Training Modular Building (TMB) are to be relocated to the existing graveled yard area within the Complex D maintenance yard. Earth based spoils generated during mass grading would be stockpiled within the Project Area, primarily where the Muscle Shoals Maintenance Base (MSMB) is to be demolished. All spoils would be reused for finish grading within the Complex D construction zone. All topsoil and subsoil materials generated from the construction activities would be used onsite as clean fill material. This effort herein will be referred to as the Proposed Action.

Buildings proposed for construction:

- Warehouse Maintenance Building (WMB)
- Enclosed Storage Building (ESB)

Buildings proposed for demolition:

- MSR Office Service Warehouse (OSW)
- MSR Muscle Shoals Maintenance Base (MSMB)

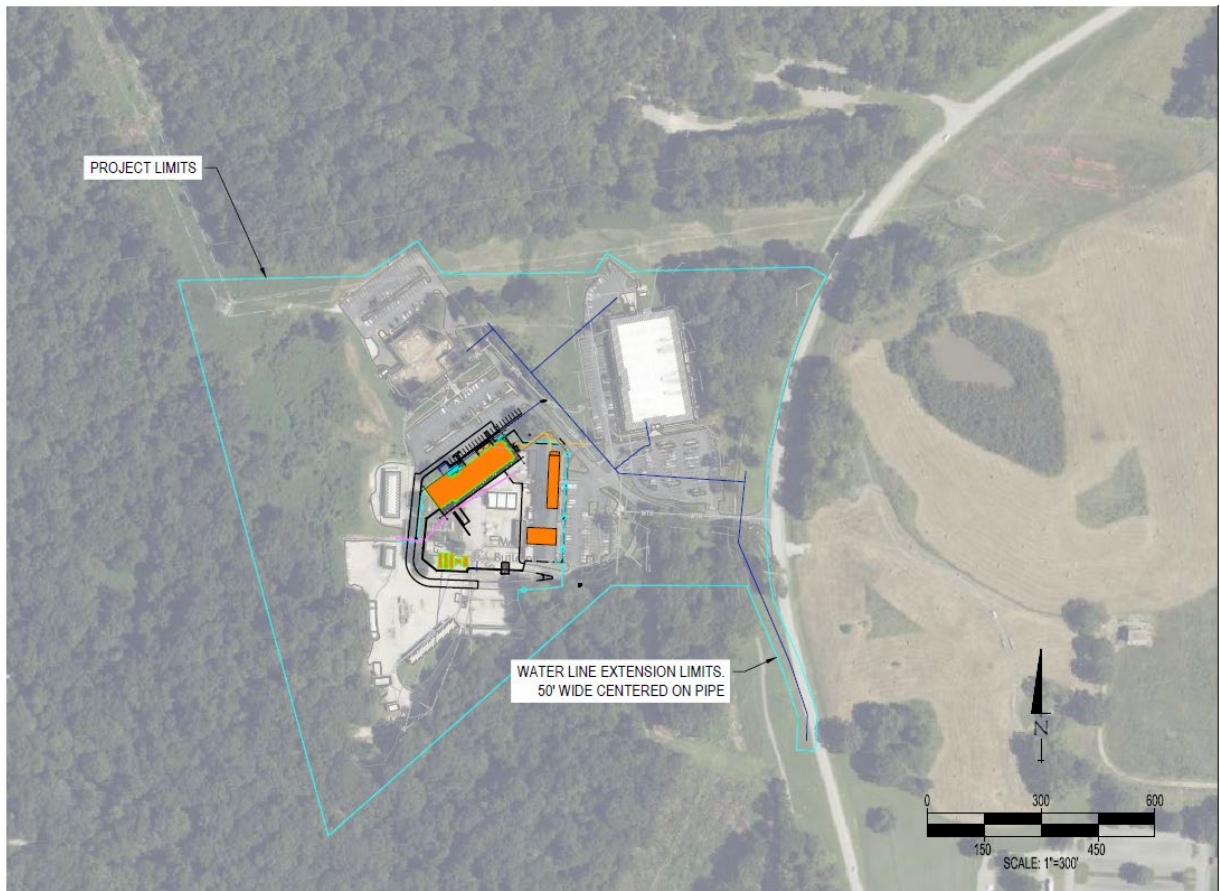
Building proposed for relocation:

- Muscle Shoals Boat Storage Building (MSBSB)
- Training Modular Building (TMB)

Buildings that would remain in place:

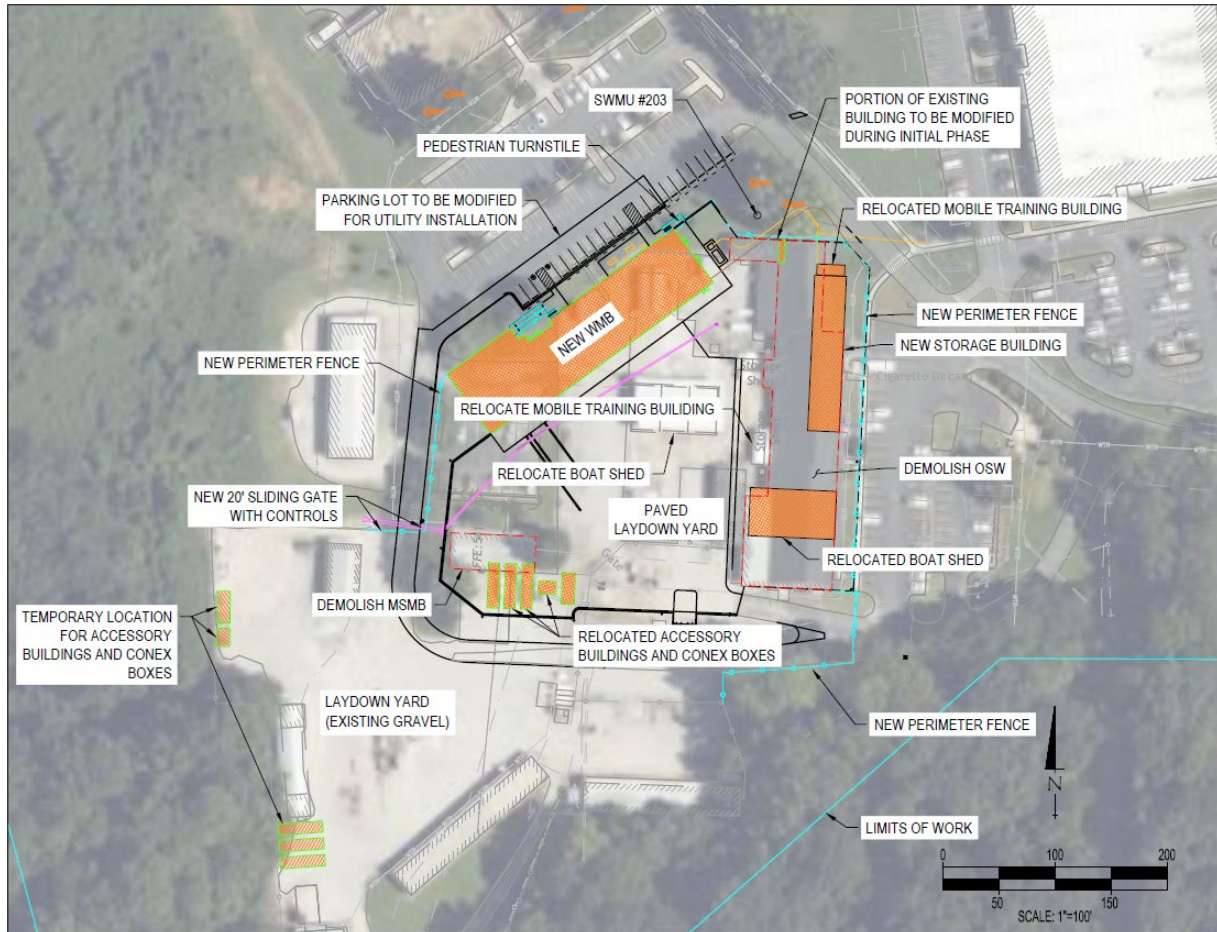
- Mini Storage Warehouse (MSW)
- Office Service Warehouse Annex (OSA)
- Multipurpose Building (MPB)
- MSR Muscle Shoals Shop/Tractor Shed (MSSTS)
- MSR Shed 3 (MSRS3)
- MSR Shed 2 (MSRS2)
- MSR Muscle Shoals Tractor Shed (MSTS)
- Storage Building (MSRSB)
- MSR Shed 1 (MSRS1)
- Flammable Storage Building #2

When combined, the structures proposed for demolition provide a total of approximately 23,816 square feet of building space. The existing buildings are currently used for a variety of purposes including office space, training, maintenance operations, and general storage purposes. The newly proposed buildings would provide approximately 19,000 square feet of modern and efficient building space, which equates to a reduction of 4,816 square feet of building space.



**Figure 2. Map of the Muscle Shoals Reservation Complex D Project Area**





**Figure 3. Map of the Muscle Shoals Reservation Complex D Renovation Details**

### Related Environmental Reviews

The following Environmental Reviews have been conducted in the general area of the proposed Project within the past several years:

*Muscle Shoals Power Service Shop Warehouse Environmental Assessment* (TVA 2019a). The EA addressed the proposed relocation of spare turbine rotors and other large generating components from throughout the Valley to a centralized location. The EA concluded that the proposed action to construct a new Warehouse at the Muscle Shoals Reservation would not be a major federal action and there would be no significant environmental impacts.

*Muscle Shoals Solar Project* (TVA 2019b). This EA addressed the proposal of the construction and operation of a solar facility in Colbert County, Alabama. The energy generated by the Project would be sold to TVA in accordance with the terms of the associated PPA and would interconnect to TVA's existing Colbert Fossil Plant. This EA assesses the environmental impacts of the construction and operation of the facility by Muscle Shoals Solar along with associated transmission interconnection actions.

*Muscle Shoals Outdoor Education and Recreation Area Improvements Environmental Assessment* (TVA 2015). The EA addressed proposed improvements to the trail/recreation system located north of Reservation Road on the Reservation. Although the EA primarily addressed improvements proposed for three main trail heads, the Reservation Road Trail crosses the potentially affected area of the proposed operations relocation.

*Muscle Shoals Reservation Redevelopment Final Environmental Impact Statement* (TVA 2011). The EIS documented the potential environmental effects of the proposed sale of 1,400 acres of land on the Reservation in Colbert County, Alabama. After the final EIS was published, TVA worked with the local community to develop a comprehensive master plan to guide development of the land. During this process, TVA identified 400 acres of land that should be retained by TVA due to ongoing TVA business needs and limited development opportunities due to prior industrial operations. The TVA Board of Directors subsequently approved the disposal of approximately 1,000 acres instead of the 1,400 acres analyzed in the final EIS. The areas evaluated in this EA are not part of the 1,400 acres analyzed in Chapter 1 – Purpose and Need for Action Draft Environmental Assessment 3 the EIS. However, the relocation of the operations currently on the land being disposed of is the action considered in this EA.

### **Scope of Environmental Assessment**

The proposed Scope of Work for this Project includes but is not limited to the following: demolition of existing structures, curbs, stormwater structures, sanitary sewer structures, utility poles, mechanical, electrical, plumbing, fire protection, and ancillary support structures for the existing buildings and site. Up to 10 trees from the interior of the Project Area would be removed during the first phase of the proposed construction sequence. Site and building development include foundation work, architectural systems, building erection, mechanical, electrical, plumbing, fire protection, sanitary sewers, waterlines, lighting, paving, roadways, parking and associated striping, landscaping, roof work, paint and coating, erosion and sediment control, fencing, security systems, communications, concrete work, and earthworks as necessary for a site development project of this nature, size and scale (Figure 1-3).

The OSW is being proposed for demolition and replacement along with the MSMB and several smaller open-walled shed structures. The Boat Shed that is within the Project Area is to be relocated to an alternative location within the Project Area on a new concrete pad. The proposed vacating of these buildings would result in options for disposal, further discussed in detail in the Alternatives section of this document. A truck access driveway would extend within the laydown yard fenced-in area from the Ocoee Drive entrance gate to the OSA parking area entrance gate that would provide access to the secured laydown yards and to the WMB loading dock area. The area north of the new Ocoee Drive entrance gate and within the new fence line would be paved as a new truck maneuvering surface and material storage yard. The existing driveways, parking areas, and sheds located south of the new truck access drive would be enclosed within the overall fenced in area.

Complex D's water supply and sanitary sewer distribution system is proposed to be updated with new water supply and sanitary lines that would extend to the Reservation Road right-of-way. The trench needed for the installation of these utilities would be proposed not to exceed 4 feet in width and 8 feet in depth, however, based on the existing site conditions, width and depth may vary within this range. The excavated trench would be backfilled with suitable material (soil or aggregate). Excess material would be stockpiled onsite for reuse or hauled



off to an approved landfill. Based on the preliminary site study, it is anticipated the total length of installed piping for the waterline and sanitary sewers would be approximately 3,000 linear feet.

An approximate seven-foot-tall perimeter fence with a 3-strand barb wire outrigger and key card access gates would be constructed around the new WMB and laydown yard. A visual example and dimension schematic of this fence can be found in Figures 4, 5, and 6.



**Figure 4. Sample Photograph of Proposed TVA Perimeter Fencing**

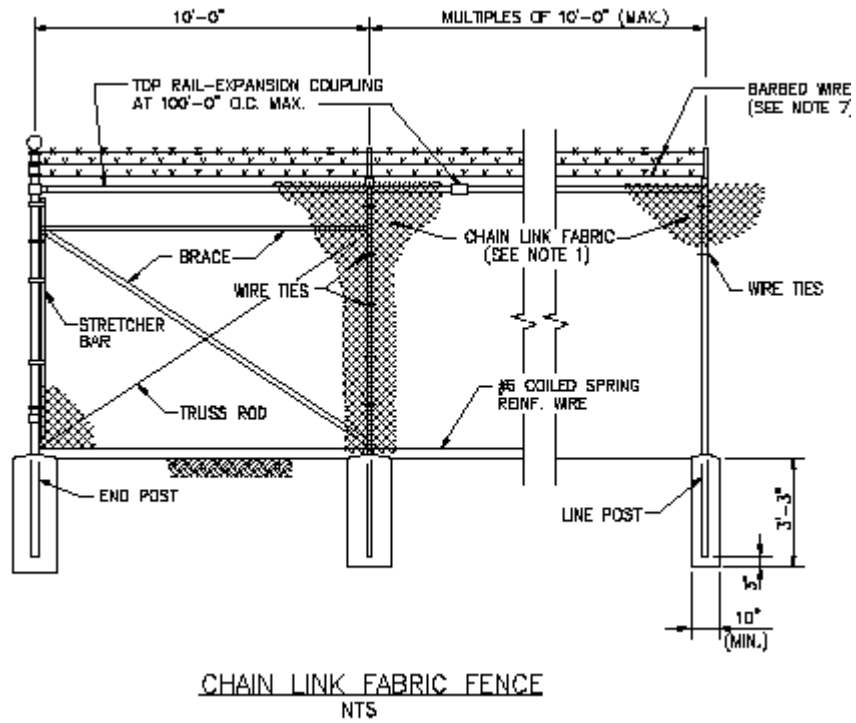


Figure 5. Detailed Schematic of TVA Perimeter Fencing with Standard Dimensions



**Figure 6. Photograph of Standard Proposed TVA Gate Entrance Structure**

### **Description of Alternatives**

In accordance with guidelines outlined in the National Environmental Policy Act (NEPA), TVA has determined there are 3 alternatives available: Alternative A – The No Action Alternative, Alternative B – Relocate, Demolish and Build New, and Alternative C – Renovate and Relocate.

#### ***Alternative A – No Action Alternative***

Under Alternative A, TVA would not pursue the effort to optimize and consolidate the facilities at Complex D on the MSR. The OSW and associated structures would remain in service in the current state. This alternative does not meet the purpose and need of the Proposed Action as the OSW and associated structures require extensive maintenance, have safety issues related to structural building codes, ADA accessibility issues, and require continued costly upkeep due to the poor condition. However, it does provide a benchmark for comparing the environmental impacts of the implementation of the Action Alternatives.

#### ***Alternative B – Relocate, Demolish and Build New***

The proposed Action Alternative B would include the following:

- Relocate the OSW offices, utilizing space at the Multipurpose Building (MPB) and Office Service Warehouse Annex (OSA) or other existing office space on the MSR
- Build a new Warehouse Maintenance Building (WMB)
- Demolish the existing OSW building and multiple accessory buildings
- Install new utility lines
- Reconfigure parking lots
- Upgrade perimeter fencing and lighting
- Build a new Enclosed Storage Building (ESB)

This alternative would also include the demolition of the OSW and MSMB, along with the relocation of the existing Boat Shed. Standard construction and demolition waste materials from the building demolition would be transported offsite to an approved local Construction and Debris (C&D) landfill. Special waste, such as asbestos waste, and unusable soil, rock and asphalt would be transported to the Morris Farms facility in Hillsboro, AL or another TVA approved permitted landfill.

### **Alternative C – Renovate and Relocate**

The proposed Action Alternative C would include the following:

The current OSW and associated structures would be renovated to address building deficiencies. The Facilities Maintenance (FM) and Property Maintenance (PM) office, shop, storage, and support functions would move to the South Wing Building (SWB) located at the Power Service Center. Grounds maintenance equipment would move to new storage sheds located south of the SWB. The lower SWB garage area would be used for shops. This option was deemed unfavorable due to the difficulty of vacating the current tenants of the SWB along with the added relocation cost. This option also included a variation to use the SWB garage area for general storage. Both variations were deemed unfavorable due to the difficulty in logistics associated with vacating the current employees in the SWB along with additional cost associated with relocation and updating the structures to accommodate the operational needs of any new tenants and update the structures to current building codes.

### **Preferred Alternative**

TVA has identified Alternative B as the preferred alternative.

### **Environmental Impacts**

This section describes the baseline environmental conditions (i.e., affected environment) of environmental resources in the Project Area and the anticipated environmental consequences that would occur from implementation of the preferred Action Alternative identified for further study. TVA considered all appropriate environmental factors potentially affected by the Proposed Action as part of this analysis including prime farmland, floodplains, wetlands, aquatic ecology, vegetation, terrestrial zoology, managed and natural areas, parks and recreation, archaeological and historic resources, soil erosion and surface water, air quality, climate change, geology, groundwater, noise, solid and hazardous materials, transportation, visual, socioeconomics and environmental justice.



### **Prime Farmland**

Prime farmland, as defined by the U.S. Department of Agriculture (USDA), “is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (i.e., the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water). The soils are of the highest quality and can economically produce sustained high yields of crops when treated and managed according to acceptable farming methods.” Prime farmland is land that is the most suitable for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops. Based on our analysis, there is no potential Prime Farmland within the Proposed Project Area, and thus no impact to Prime Farmland is expected.

### **Floodplains**

Based on the Colbert County, AL, Flood Insurance Rate Map Panels 01033C0144D and 01033C0145D, both effective 2/17/2010, the proposed consolidation at Complex D would be located outside of any mapped 100-year floodplains, which would be consistent with Executive Order (EO) 11988. The Proposed Action would thus have no impact on floodplains, function or natural and beneficial values.

### **Wetlands**

Wetlands are those areas inundated or saturated by surface or groundwater such that vegetation adapted to saturated soil conditions are prevalent. Examples include bottomland forests, swamps, wet meadows, isolated depressions, and fringe wetland along the edges of watercourses and impoundments. Wetlands provide many societal benefits including toxin absorption and sediment retention for improved downstream water quality, storm water attenuation for flood control, shoreline buffering for erosion protection, and provision of fish and wildlife habitat for commercial, recreational, and conservation purposes. Therefore, a wetland assessment was performed to ascertain wetland presence, condition, and extent to which wetland functions may be provided on site.

A field survey was conducted in April 2023 to determine wetland presence or absence; no wetlands were identified within the Project Area. Soil Survey Geographic Database (SSURGO) indicates partially hydric soils may be present, yet no National Wetlands Inventory (NWI) features are mapped within the Project Area. Aerial imagery of the Project Area indicates a majority upland forest with some commercial use. United States Geological Survey (USGS) topography indicates Complex D is a relatively upland area with steeper grades along its edges. Wetland determinations were performed according to US Army Corps of Engineers (USACE) standards (Environmental Laboratory 1987, USACE 2012), which require documentation of hydrophytic vegetation (Lichvar et al. 2016), hydric soil, and wetland hydrology. No hydric soil, wetland hydrology, or hydrophytic vegetation were identified in combination during the field survey. Therefore, no wetlands are present, and no wetland impacts are anticipated to result from the Proposed Action.

### **Aquatic Ecology**

The Project Area is encompassed by the Tennessee River-Pickwick Lake (0603000508) 10-digit hydrologic unit code (HUC) watershed. A listing of aquatic features (streams and conveyances) in the Project Area is provided in Appendix A. The intermittent stream (Sequence IDS001) documented during the field survey was forested and had substrate composition consisting primarily of clay and gravel. The 11 wet weather conveyances were mostly dry and all with no flow. Nine of the conveyances were located within a forested area, and the other 2 were in cleared areas within the Project Area.



TVA assigns appropriate Streamside Management Zones (SMZs) and best management practices (BMPs) following field surveys. Stream categorization, potential presence of listed species, and other factors are included in this analysis. Appropriate application of the BMPs minimizes the potential for impacts to water quality and instream habitat for aquatic organisms.

The Endangered Species Act (ESA) provides broad protection for species of fishes, wildlife, and plants that are listed as threatened or endangered in the United States or elsewhere. The Act outlines procedures for federal agencies to follow when taking actions that may jeopardize federally listed species or designated critical habitat. The policy of Congress is that federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the Act's purposes.

A review of the TVA Natural Heritage Database for records of listed aquatic animal species indicated that 32 federally listed aquatic species are known within the potentially affected 10-digit HUC watershed of the Project Area (Table 1). Additionally, 36 of the aquatic species queried in the watershed are state-listed in Alabama. An Information for Planning and Consultation (iPaC) query of the proposed Project Area yielded two additional species: The Cumberland Bean and Winged Mapleleaf. Both mussels are listed as non-essential experimental populations. None of the streams documented during the April 2023 field survey would provide suitable habitat to support any of the species listed in Table 1. Therefore, due to a lack of suitable habitat within the Project Area for listed aquatic species, the Proposed Action is not anticipated to impact federally threatened, endangered or state-listed aquatic species.

**Table 1. Records of federal and state-listed aquatic animal species within the Tennessee River-Pickwick Lake (0603000508) 10-digit HUC watershed.<sup>1</sup>**

| Common Name          | Scientific Name                  | Element Rank <sup>2</sup> | Federal Status <sup>3</sup> | State Status (rank <sup>4</sup> ) |
|----------------------|----------------------------------|---------------------------|-----------------------------|-----------------------------------|
| <b>FISH</b>          |                                  |                           |                             |                                   |
| Spotfin Chub         | <i>Erimonax monachus</i>         | X                         | LT, XN                      | SP (SX)                           |
| Snail Darter         | <i>Percina tanasi</i>            | AB                        | DL                          | SP (S1)                           |
| Alabama Cavefish     | <i>Speoplatyrhinus poulsoni</i>  | E                         | LE                          | SP (S1)                           |
| Southern Cavefish    | <i>Typhlichthys subterraneus</i> | E                         |                             | SP (S3)                           |
|                      |                                  |                           |                             |                                   |
| <b>SNAILS</b>        |                                  |                           |                             |                                   |
| Anthony's Riversnail | <i>Athearnia anthonyi</i>        | E                         | LE, XN                      | SP (S1)                           |
| Knob Mudalia         | <i>Leptoxis minor</i>            | H                         |                             | (SX)                              |
| Armored Rocksnail    | <i>Lithasia armigera</i>         | E                         |                             | (S1)                              |
| Ornate Rocksnail     | <i>Lithasia geniculata</i>       | E                         |                             | (S1)                              |
| Warty Rocksnail      | <i>Lithasia lima</i>             | H                         |                             | (S1)                              |
| Muddy Rocksnail      | <i>Lithasia salebrosa</i>        | E                         |                             | (S1)                              |
| Varicose Rocksnail   | <i>Lithasia verrucosa</i>        | H                         |                             | (S3)                              |
| Rugged Hornsnail     | <i>Pleurocera alveare</i>        | H                         |                             | (S1)                              |

|                                |   |   |         |             |
|--------------------------------|---|---|---------|-------------|
| Spiral Hornsnail               | <i>Pleurocera brumbyi</i>               | E |         | (S2S3)      |
| Corpulent Hornsnail            | <i>Pleurocera corpulenta</i>            | H | UR      | (S1)        |
| Shortspire Hornsnail           | <i>Pleurocera curta</i>                 | H | UR      | (S1S2)      |
| Telescope Hornsnail            | <i>Pleurocera walkeri</i>               | H |         | (S3)        |
|                                |   |   |         |             |
| <b>MUSSELS</b>                 |   |   |         |             |
| Pheasant Shell                 | <i>Actinonaias pectorosa</i>            | H |         | PSM (SX)    |
| Rock Pocketbook                | <i>Arcidens confragosus</i>             | D |         | PSM (S3)    |
| Spectaclecase                  | <i>Cumberlandia monodonta</i>           | E | LE      | SP (S1)     |
| Fanshell                       | <i>Cyprogenia stegaria</i>              | C | LE, XN  | SP (S1)     |
| Dromedary Pearlymussel         | <i>Dromus dromas</i>                    | E | LE, XN  | SP (SX)     |
| Slowwater Elimia               | <i>Elimia interveniens</i>              | E |         | (S2)        |
| Butterfly                      | <i>Ellipsaria lineolata</i>             | E |         | PSM (S4)    |
| Spike                          | <i>Elliptio dilatata</i>                | E |         | PSM (S1)    |
| Sugarspoon                     | <i>Epioblasma arcaeiformis</i>          | H |         | PSM (SX)    |
| Angled Riffleshell             | <i>Epioblasma biemarginata</i>          | H |         | PSM (SX)    |
| Cumberlandian Combshell        | <i>Epioblasma brevidens</i>             | H | LE, XN  | SP (S1)     |
| Oyster Mussel                  | <i>Epioblasma capsaeformis</i>          | E | LE, XN  | SP (SX)     |
| Yellow-blossom Pearlymussel    | <i>Epioblasma florentina florentina</i> | X | LE, PDL | SP (SX)     |
| Acornshell                     | <i>Epioblasma haysiana</i>              | H |         | PSM (SX)    |
| Purple Catpaw                  | <i>Epioblasma obliquata obliquata</i>   | H | LE, XN  | SP (SX)     |
| Round Combshell                | <i>Epioblasma personata</i>             | X |         | PSM (SX)    |
| Cumberland Leafshell           | <i>Epioblasma stewardsonii</i>          | X |         | PSM (SX)    |
| Tubercled Blossom Pearlymussel | <i>Epioblasma torulosa torulosa</i>     | X | LE, PDL | SP (SX)     |
| Snuffbox                       | <i>Epioblasma triquetra</i>             | H | LE,     | PSM (S1)    |
| Turgid Blossom Pearlymussel    | <i>Epioblasma turgidula</i>             | X | LE, PDL | SP (SX)     |
| Shiny Pigtoe Pearlymussel      | <i>Fusconaia cor</i>                    | X | LE, XN  | SP (S1)     |
| Fine-rayed Pigtoe              | <i>Fusconaia cuneolus</i>               | H | LE, XN  | SP (S1)     |
| Longsolid                      | <i>Fusconaia subrotunda</i>             | H | PT      | PSM (S1)    |
| Cracking Pearlymussel          | <i>Hemistena lata</i>                   | H | LE, XN  | SP, P1 (S1) |
| Pink Mucket                    | <i>Lampsilis abrupta</i>                | E | LE      | SP (S1)     |
| Wavy-rayed Lampmussel          | <i>Lampsilis fasciola</i>               | H |         | PSM (S2)    |
| Pocketbook                     | <i>Lampsilis ovata</i>                  | E |         | PSM (S2)    |
| Alabama Lampmussel             | <i>Lampsilis virescens</i>              | X | LE, XN  | SP (S1)     |
| Birdwing Pearlymussel          | <i>Lemiox rimosus</i>                   | E | LE, XN  | SP (S1)     |
| Scaleshell                     | <i>Leptodea leptodon</i>                | H | LE      | SP (SX)     |
| Black Sandshell                | <i>Ligumia recta</i>                    | E |         | PSM (S2)    |
| Cumberland Moccasinshell       | <i>Medionidus conradicus</i>            | H | UR      | SP (S1)     |
| Hickorynut                     | <i>Obovaria olivaria</i>                | H |         | PSM (SX)    |
| Ring Pink                      | <i>Obovaria retusa</i>                  | C | LE, XN  | SP (SH)     |
| Round Hickorynut               | <i>Obovaria subrotunda</i>              | H | PT      | PSM (S2)    |

|                           |                                       |    |        |           |
|---------------------------|---------------------------------------|----|--------|-----------|
| White Wartyback           | <i>Plethobasus cicatricosus</i>       | E  | LE, XN | SP (S1)   |
| Orange-foot Pimpleback    | <i>Plethobasus cooperianus</i>        | H  | LE, XN | SP (SX)   |
| Sheepnose                 | <i>Plethobasus cyphus</i>             | E  | LE     | SP (S1)   |
| Clubshell                 | <i>Pleurobema clava</i>               | H  | LE, XN | SP (SX)   |
| Ohio Pigtoe               | <i>Pleurobema cordatum</i>            | C  |        | PSM (S2)  |
| Tennessee Clubshell       | <i>Pleurobema oviforme</i>            | H  | UR     | PSM (S1)  |
| Rough Pigtoe              | <i>Pleurobema plenum</i>              | E  | LE, XN | SP (S1)   |
| Pyramid Pigtoe            | <i>Pleurobema rubrum</i>              | E  | PT     | SP (S1)   |
| Round Pigtoe              | <i>Pleurobema sintoxia</i>            | E  |        | SP (S1)   |
| Tennessee Pigtoe          | <i>Pleurobema barnesiana</i>          | H  | UR     | PSM (S1)  |
| Slabside Pearlymussel     | <i>Pleurobema dolabelloides</i>       | H  | LE     | SP (S1)   |
| Kidneyshell               | <i>Ptychobranhus fasciolaris</i>      | E  |        | PSM (S2)  |
| Fluted Kidneyshell        | <i>Ptychobranhus subtentum</i>        | H  | LE     | SP (SX)   |
| Smooth Rabbitsfoot        | <i>Quadrula cylindrica cylindrica</i> | C  | LT     | SP (S1)   |
| Winged Mapleleaf          | <i>Quadrula fragosa</i>               |    | LE, XN | SP(SNA)   |
| Cumberlandia Monkeyface   | <i>Quadrula intermedia</i>            | X  | LE, XN | SP (SX)   |
| Monkeyface                | <i>Theliderma metanevra</i>           | E  |        | PSM (S3)  |
| Purple Lilliput           | <i>Toxolasma lividus</i>              | E  |        | PSM (S2)  |
| Deertoe                   | <i>Truncilla truncata</i>             | E  |        | PSM (S1)  |
| Rayed Bean                | <i>Villosa fabalis</i>                | H  | LE     | (SX)      |
| Painted Creekshell        | <i>Villosa taeniata</i>               | H  |        | PSM (S2)  |
| Cumberland bean           | <i>Villosa trabalis</i>               |    | E, XN  | SX        |
| Mountain Creekshell       | <i>Villosa vanuxemensis</i>           | H? |        | PSM (S3)  |
|                           |                                       |    |        |           |
| <b>CRUSTACEANS</b>        |                                       |    |        |           |
| Alabama Cave Crayfish     | <i>Cambarus jonesi</i>                | E  |        | (S2)      |
| Alabama Blind Cave Shrimp | <i>Palaemonias alabamiae</i>          | E  | LE     | SP (S1)   |
| Phantom Cave Crayfish     | <i>Procambarus pecki</i>              | H? |        | SP (S1S2) |

<sup>1</sup> Source: TVA Natural Heritage and USFWS IPac databases, queried on 4/24/2023

<sup>2</sup> Heritage Element Occurrence Rank: E = extant record ≤25 years old; H=historical record ≥ 25 years old; H?= Possibly historical; A=Excellent estimated viability; B=Good est. viability; C=fair est. viability; D=Poor est. viability; X=extirpated;

<sup>3</sup> Status Codes: LE or E = Listed Endangered; LT or T = Listed Threatened; SP = State Protected; UR = Under Review; DL = Delisted; PSM=Partial Status Mussels; XN = Non-essential experimental population; SNA = Not applicable

<sup>4</sup> State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Abundant; SX= Presumed Extirpated

Upon adoption of the Proposed Action, Aquatic Ecology would be temporarily impacted during the renovation and relocation phase. Potential impacts would occur indirectly due to modification of the riparian zone. An increase in storm water runoff could also result from construction and maintenance activities. Potential impacts due to the removal of streamside vegetation within the riparian zone include increased erosion and siltation, loss of instream habitat, and increased stream temperatures. Other potential effects resulting from

construction and maintenance activities include herbicide runoff into streams through stormwater discharge.

Water courses that convey only surface water during storm events (such as ephemeral streams) that could be affected by the Proposed Action would be protected by standard BMPs as identified by TVA (TVA 2022). These BMPs are designed in part to minimize disturbance of riparian areas and subsequent erosion and sedimentation that can be carried into streams. TVA also provides additional categories of protection to watercourses based on the variety of species and habitats that exist in the streams, as well as the state and federal requirements to avoid harming certain species (Table 1). The width of the SMZs is determined by the type of watercourse, primary use of the water resource, topography, or other physical barriers (TVA 2022).

Applicable permits from the state of Alabama and USACE, or Clean Water Act Section 404 Permits would be obtained for any stream alterations and the terms and conditions of these permits would be followed in addition to guidelines outlined in TVA (TVA 2022). Impacts to the SMZs listed in Appendix A would be minor and temporary with implementation of BMPs.

### **Vegetation**

Field surveys were conducted in April of 2023 to document plant communities, infestations of invasive plants, and to search for possible threatened and endangered plant species. All plant communities present on the parcel were visited during the survey. Using the National Vegetation Classification System (Grossman et al. 1998), vegetation types observed during field surveys can be classified as a combination of deciduous forest and herbaceous vegetation. No forested areas in the Project Area had structural characteristics indicative of old growth forest stands (Leverett 1996).

Most of the natural areas within the Project Area are forested. The areas with herbaceous vegetation are manicured lawns or weedy edges dominated by invasive species. All the forests in the Project Area are deciduous in composition, which are characterized by trees with overlapping crowns where deciduous species account for more than 75 percent of the canopy cover. Deciduous forests in the Project Area are dominated by a variety of tree species including a forest edge dominated by hackberry. Tree species of the interior forest include, sweetgum, American elm, black tupelo, northern red oak, cherry bark oak, black oak, tulip tree, post oak, mockernut hickory, shellbark hickory, and white oak. The understory consisted of Chinese privet, sweet cicely, May apple, little sweet Betsy, Japanese honeysuckle, white, snakeroot, elderberry, baby blue eyes, yellow fumewort, jewelweed, poison ivy, Virginia creeper, and Christmas fern. Of this vegetation composition, the invasive plant species found within the Project Area are listed in Table 2. The deciduous forests in the Project Area have trees that average between 12 and 30 inches in diameter at breast height (DBH), with several oaks and a few tulip trees reaching over 35 inches DBH.

EO 13112 defines an invasive species as any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem and whose introduction does or is likely to cause economic or environmental harm or harm to human health. In the context of plants, they occur as trees, shrubs, vines, grasses, ferns, and forbs. These robust plants have few natural predatory insects or diseases, such as those that tend to keep native plants in natural balance. Invasive plants are common in and near the Project Area. They include Chinese privet, Japanese honeysuckle, Japanese stilt grass, periwinkle, and kudzu. All of these species have the

potential to affect the native plant communities adversely because of their ability to spread rapidly and displace native vegetation.

**Table 2. Invasive plant species observed during 2023 field surveys of TVA Muscle Shoals Reservation Complex D**

| Common Name          | Scientific Name              |
|----------------------|------------------------------|
| Chinese Privet       | <i>Ligustrum sinense</i>     |
| Japanese Honeysuckle | <i>Lonicera japonica</i>     |
| Japanese stilt grass | <i>Microstegium vimineum</i> |
| Kudzu                | <i>Pueraria montana</i>      |
| Periwinkle           | <i>Vinca major</i>           |

An April 2023 review of the TVA Natural Heritage Database indicated that no federally listed, and five state-listed plant species have been previously reported from within 5 miles of the proposed Project Area. Four federally listed plants are known to be present in Lawrence County, AL (Table 3). However, an iPaC query resulted in no federally listed species and no critical habitat for plant species occurring in the Project Area.

Aerial photos, site photos, topographic maps, knowledge of rare plant habitats, and field surveys of the Project Area indicate that federally listed or proposed threatened plant species do not occur on the site. Plant species known from Lawrence County, AL that possess federal status require specialized habitats not found within the proposed Project Area.

**Table 3. State-listed plant species previously documented from within a five-mile vicinity of the TVA Muscle Shoals Reservation Complex D Project and federally listed plants from Lawrence County, Alabama.<sup>1</sup>**

| Common Name                          | Scientific Name                 | Federal Status <sup>2</sup> | State Status <sup>2</sup> | State Rank <sup>3</sup> |
|--------------------------------------|---------------------------------|-----------------------------|---------------------------|-------------------------|
| Dutchman's Breeches                  | <i>Dicentra cucullaria</i>      | -                           | SLNS                      | S2                      |
| Leafy Prairie-clover <sup>4</sup>    | <i>Dalea foliosa</i>            | E                           | SLNS                      | S1                      |
| White Trout Lily                     | <i>Erythronium albidum</i>      | -                           | SLNS                      | S1S2                    |
| False Rue Anemone                    | <i>Enemion biternatum</i>       | -                           | SLNS                      | S2                      |
| Wall-rue Spleenwort                  | <i>Asplenium ruta-muraria</i>   | -                           | SLNS                      | S1                      |
| Blue-Eyed Mary                       | <i>Collinsia verna</i>          | -                           | SLNS                      | S1                      |
| Lyrate Bladderpod <sup>4</sup>       | <i>Lesquerella lyrata</i>       | T                           | SLNS                      | S1                      |
| Fleshy-fruit Gladecress <sup>4</sup> | <i>Leavenworthia crassa</i>     | E                           | SLNS                      | S1                      |
| White Fringeless Orchid <sup>4</sup> | <i>Platanthera integrilabia</i> | T                           | SLNS                      | S2                      |

<sup>1</sup> Source: TVA Natural Heritage Database, April 2023.

<sup>2</sup> Status Codes: E = Listed Endangered; SLNS = State Listed, no status assigned; SPCO = Listed Special Concern; T = Listed Threatened.

<sup>3</sup> State Ranks: S1 = Critically Imperiled; S2 = Imperiled.

<sup>4</sup> Federally-listed species occurring within the county where work would occur, but not necessarily within 5 miles of the Project Area



Adoption of the preferred Action Alternative (Alternative B) would not impact federal or state-listed plant species because no individual plants or habitat capable of supporting listed species occurs in portions of the Project Area where work would occur. This action would not significantly affect the vegetative community of the region. The forested and herbaceous plant communities currently found on the site do not support native plant communities with significant conservation value. Portions of the Project Area would be permanently converted, but these areas do not support unique plant communities. The implementation of the Proposed Action would have no significant impact on the vegetative community within the Project Area.

### **Terrestrial Zoology**

The Project Area is comprised of developed areas (buildings, parking lots, roads, and storage warehouses) with ornamental trees surrounding some buildings and parking lots. Areas of mowed grass exist in between parking lots and buildings. Mixed deciduous forest fragments exist on the perimeter of the Project Area. A field survey of the trees proposed for removal was conducted on May 4, 2023, by TVA Biologists.

The small areas of mowed lawn with weedy edges and scattered trees found within the action area provide some habitat for common species including birds such as American robin, Carolina chickadee, blue jay, European starling, house sparrow, mourning dove, northern cardinal and northern mockingbird (National Geographic 2002). Mammals found in this community type include eastern gray squirrel, nine-banded armadillo, northern raccoon and Virginia opossum (Whitaker 1996). Road-side ditches provide potential habitat for amphibians including American toad, upland chorus frog and spring peeper. Reptiles potentially present include black rat snake and eastern garter snake (Powell et al. 2016). Weedy edges of forests and mowed areas with flowering plants may provide limited habitat for pollinator species such as gulf fritillary, eastern tailed-blue, black swallowtail, and cloudless sulphur (Brock and Kaufman 2003).

The forested areas within the Project Area but outside of the proposed construction footprint are comprised of deciduous tree species and provide habitat for common birds such as Carolina chickadee, Carolina wren, cedar waxwings, chipping sparrow, eastern blue bird, eastern towhee, golden crowned kinglet, northern cardinal, northern flicker, northern mockingbird, red tailed hawk, song sparrow, tufted titmouse, and white-throated sparrow (National Geographic 2002). Mammals found in these habitats include common raccoon, opossum, white-tailed deer, eastern gray squirrel, and Virginia opossum (Whitaker 1996). Common reptile species also use similarly disturbed habitats including American toad, eastern box turtle, eastern garter snake, and Fowler's toad (Powell et al. 2016).

The Proposed Action would result in the displacement of any wildlife (primarily common, habituated species) currently using the area. While buildings proposed for demolition have been actively used in recent months and have not been left abandoned or open for use wildlife, direct effects to some individuals could occur if those individuals are immobile during the time of vegetation removal (e.g., during breeding/nesting or hibernation seasons). Habitat removal likely would disperse mobile wildlife into surrounding areas in attempt to find new food resources, shelter, and to reestablish territories. Due to the amount of similarly suitable habitat in areas immediately adjacent to the Project Area, populations of common wildlife species likely would not be impacted by the Proposed Action.

One colonial wading bird colony is known from 2.03 miles away. No wading bird colonies exist within the Project Area. Review of the IPaC in May 2023, identified 14 migratory bird species of conservation concern that have the potential to occur within the Project Area: bald eagle, bobolink, brown-headed nuthatch, cerulean warbler, chimney swift, field sparrow, Kentucky warbler, king rail, lesser yellowlegs, prairie warbler, prothonotary warbler, red-headed woodpecker, rusty blackbird, and wood thrush. See below for discussion of potential impacts to bald eagles.

Bobolinks are typically found in lush grasslands or fields of clover, wheat, and alfalfa. No habitat for bobolink exists in the Project Area. Brown-headed nuthatch prefer long-leaf pine forests but when not available, will also use open pine stands even in human-modified habitats. Suitable habitat for brown-headed nuthatch does not occur in the Project Area. Cerulean warblers are found in moist, hardwood forests (Nicholson 1997). Suitable habitat may occur for Cerulean warblers in the mature forested area at the edges of the Project Area. Chimney swifts use chimneys in more urban areas as nesting sites and communal roosts (Palmer-Ball 1996). No chimney-like structures exist within the Project Area. Field sparrows are found in brushy fields. Suitable habitat for field sparrow does not exist in the action area. Kentucky warblers are found in woodlands with dense understories. Suitable habitat for Kentucky warbler may occur in the mature forested area at the edges of the Project Area. King rails are secretive marsh birds (Nicholson 1997). No wetlands exist in the Project Area therefore no habitat for this species occurs in the Project Area. Lesser yellowlegs migrate through Alabama using wet muddy areas and areas of shallow open water as stopover sites (Tibbits and Moskoff 2020). Suitable habitat for lesser yellowlegs does not exist in the Project Area. Prairie warblers are found in dry secondary growth forests with abundant shrubs and an open canopy. Suitable habitat for prairie warbler does not occur in the Project Area. Prothonotary warblers are found in mature bottomland hardwood forests and swamps (Nicholson 1997). Suitable habitat for prothonotary warbler does not occur in the Project Area. Red-headed woodpeckers use a variety of treed habitats but show preference for forested areas exhibiting more openness and a high number of tree snags available (Frei et al. 2020). Red-headed woodpecker habitat is present within the mature forest sections of the Project Area. Rusty blackbirds overwinter in the region and use wet areas such as swamps, pond edges, or hardwood bottomlands woodlands (Avery 2020). Suitable habitat for rusty blackbird does not exist in the Project Area. Wood thrushes are associated with larger tracts of mature mixed-deciduous forests with open forest floors (Evans et al. 2020). The forested areas within and adjacent to the Project Area are large enough that wood thrushes may use the area as breeding habitat. No suitable habitat for any of these migratory bird species of concern would be impacted under the Proposed Action. All trees proposed for removal are deciduous and in an urban/developed landscape in between buildings and parking areas. Breeding and foraging habitat does not exist for chimney swift within the action area. Due to distance from known wading bird colonies and lack of suitable habitat for other birds of concern, the Proposed Action would not impact the populations of migratory birds.

Six cave records are known within three miles of the Project Area, the closest of which is approximately 1.95 miles away. No caves were observed during the field survey. Due to the distance from the proposed actions, caves would not be impacted by the proposed actions.

Review of the TVA Regional Natural Heritage Database in January 2023, resulted in records of one state-listed species (hellbender), one species of state conservation concern (osprey), one federally protected species (bald eagle), on federally listed species (gray bat), and one federally proposed threatened species (alligator snapping turtle) within three miles of the Project Area. A search for federally listed species within Colbert County, AL identified two additional species: endangered but proposed threatened red-cockaded woodpecker and the proposed endangered tricolored bat. Additional review of the IPaC tool in May 2023, identified the Indiana bat, northern long-eared bat, monarch butterfly (candidate for federal listing), and whooping crane (experimental, non-essential population) as species that have the potential to occur within the Project Area. Table 4 contains a species list of species of conservation concern (state-listed or state ranked S1-S3) within three miles of the Project Area, federally listed species within the Project Area County, and IPaC species results for the Project Area. Species-specific information and habitat suitability within the Project Area are discussed below.

**Table 4. Federally listed terrestrial animal species reported from Colbert County, Alabama and other species of conservation concern documented within three miles of the Project Area for: Muscle Shoals Reservation Complex D Consolidation Environmental Assessment<sup>1</sup>**

| Common Name                          | Scientific Name                     | Status <sup>2</sup> |  |
|--------------------------------------|-------------------------------------|---------------------|--|
|                                      |                                     | Federal             | State <sup>3</sup><br>(Rank <sup>3</sup> ) |
| <b>Amphibians</b>                    |                                     |                     |  |
| Hellbender                           | <i>Cryptobranchus alleganiensis</i> | PS <sup>4</sup>     | SP(S2)                                     |
| <b>Birds</b>                         |                                     |                     |  |
| Bald eagle                           | <i>Haliaeetus leucocephalus</i>     | DL                  | SP(S4B)                                    |
| Osprey                               | <i>Pandion haliaetus</i>            | -                   | SP(S4)                                     |
| Red-cockaded woodpecker <sup>5</sup> | <i>Picoides borealis</i>            | E, PT               | SP(S2)                                     |
| Whooping crane <sup>6</sup>          | <i>Grus americana</i>               | EXPN                | -  |
| <b>Invertebrates</b>                 |                                     |                     |  |
| Monarch butterfly <sup>6,7</sup>     | <i>Danaus plexippus</i>             | C                   | -(S5)                                      |
| <b>Mammals</b>                       |                                     |                     |  |
| Gray bat                             | <i>Myotis grisescens</i>            | E                   | SP(S2)                                     |
| Indiana bat <sup>6</sup>             | <i>Myotis sodalis</i>               | E                   | SP(S2)                                     |
| Northern long-eared bat <sup>6</sup> | <i>Myotis septentrionalis</i>       | E                   | SP(S2)                                     |
| Tricolored bat <sup>5</sup>          | <i>Perimyotis subflavus</i>         | PE                  | -  |
| <b>Reptiles</b>                      |                                     |                     |  |
| Alligator snapping turtle            | <i>Macrochelys temminckii</i>       | PT                  | SP(S3)                                     |

<sup>1</sup>Source: TVA Regional Natural Heritage Database, extracted 1/31/2023 and USFWS Information for Planning and Consultation (IPaC) resource list (<https://ecos.fws.gov/ipac/>), accessed 5/22/2023.

<sup>2</sup>Status Codes: C = Candidate species; DL = Delisted; E = Endangered; EXPN = Experimental Population, Non-Essential; PE = Proposed Endangered; PS = Partial Status; PT = Proposed Threatened; SP = State Protected.

<sup>3</sup>State Ranks: S1 = Critically Imperiled; S2 = Imperiled; S3 = Vulnerable; S4 = Apparently Secure; s5 = Secure; S#B = Status of breeding population.

<sup>4</sup>Subspecies of hellbender found in the Ozarks of Missouri and Arkansas are federally listed. Subspecies of hellbender found in Colbert County, Alabama are not federally listed.

<sup>5</sup>Species known from Colbert County, Alabama but not from within three miles of the Project Area.

<sup>6</sup>USFWS has determined that this species could occur within the Project Area.

<sup>7</sup>Historically this species has not been tracked by state or federal heritage programs.

Hellbenders are found in larger, fast-flowing, streams and rivers with large shelter rocks. Eggs are laid in depressions created beneath large rocks or submerged logs (Petranka 1998). The nearest known hellbender record occurs approximately 2.98 miles from the Project Area and is a possibly historical record due to the age of the record. No suitable habitat for hellbender exists in the Project Area; therefore, this species would not be impacted by the Proposed Action.

Bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). This species is associated with large mature trees capable of supporting their nests that can weigh several hundred pounds and are typically built near larger waterways where they forage primarily for fish (USFWS 2007a). Several bald eagle nests occur within Colbert County, AL. The nearest bald eagle nest is approximately 1.51 miles from the Project Area in Lauderdale County, AL. No bald eagles or nests were observed during field reviews of the Project Area in May 2023. Foraging habitat is not present within the Project Area. Ospreys are medium-sized raptors that are typically associated with water since this species forages exclusively for fish (Bierregaard et al. 2020). Ospreys build nests in trees or man-made structures (e.g., transmission structures) near or over water. Two osprey nest records are known within three miles of the Project Area, the closest of which is approximately 1.95 miles away. Foraging habitat is not present within the Project Area. No ospreys or osprey nests were observed during field reviews of the Project Area in May 2023. Due to the distance away from known records, and lack of suitable foraging habitat, the Proposed Action would not impact ospreys or bald eagles. The proposed Action Alternative is in compliance with the National Bald Eagle Management Guidelines.

The red-cockaded woodpecker forages and nests in large old pines located in mature pine forest with an open canopy. Any remaining fragments of this habitat are critical to the recovery of this species (USFWS 2003). The deciduous forest within the Project Area is not suitable habitat for the red-cockaded woodpecker because it lacks suitable large pine trees and has a closed canopy and a dense shrub understory. Additionally, the closest record of this species is approximately 9.9 miles away and the only records within Colbert County, AL are historic. Therefore, this species would not be impacted by the Proposed Action.

Whooping cranes migrate through Alabama twice per year in small flocks of three to five birds. During this migration they stop to feed and rest in wetland complexes, marshes, ponds, lakes, rivers, and agricultural fields (USFWS 2023a). The Project Area does not provide suitable habitat for whooping crane; therefore, this species would not be impacted by the Proposed Action.

The monarch butterfly is a highly migratory species, with eastern United States populations overwintering in Mexico. Monarch populations typically return to the eastern U.S. in April (Davis and Howard 2005). Summer breeding habitat requires milkweed plant species, on which adults exclusively lay eggs for larvae to develop and feed on. Adults will drink nectar from other blooming wildflowers when milkweeds are not in bloom (NatureServe 2022). There may be small amounts of weedy herbaceous flowering plants along the edges of the roads or in ditches of the Project Area that provide a small amount of foraging habitat for this species. Significant breeding or foraging habitat is not present within the Project Area.

Construction of the waterline and perimeter fence may impact some areas of potential foraging habitat. Several areas adjacent to the Project Area offer similar habitat that adult individuals could utilize if they are disturbed from the area during the time of construction. Though this species has not been historically tracked by state or federal heritage programs, the IPaC tool determined that this species could occur within the Project Area. This species is currently listed under the ESA as a candidate species and is not subject to Section 7 consultation under the ESA. Impacts to the monarch butterfly are expected to be minor as a result of the Proposed Action.

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall (Brady et al. 1982, Tuttle 1976 a,b). Bats disperse over bodies of water at dusk where they forage for insects emerging from the surface of the water (Harvey 2011). The closest record of gray bat is from a mist net capture approximately 0.28 miles away in 2007. No caves are known within the Project Area or were observed during field surveys in May 2023. Aquatic foraging habitat is present within the Project Area when intermittent streams and wet weather conveyances are full.

Indiana bats hibernate in caves in winter and use areas around them in fall and spring (for swarming and staging), prior to migration back to summer habitat. During the summer, Indiana bats roost under the exfoliating bark of dead and living trees in mature forests with an open understory, often near sources of water. Indiana bats are known to change roost trees frequently throughout the season, yet still maintain site fidelity, returning to the same summer roosting areas in subsequent years. This species forages over forest canopies, along forest edges and tree lines, and occasionally over bodies of water (Kurta et al. 2002, USFWS 2007b USFWS 2023b). The Indiana bat has been documented in Colbert County, AL but only at a stop-over site during migration. One individual Indiana bat was radio-tracked a location on the Reservation approximately 0.87 miles from the Project Area in April 2016 by Copperhead Environmental Consulting, Inc.; however, the location of the roost tree could not be determined because the transmitter used to track the bat fell off before the roost tree was located. The transmitter was later located on top of a light in a warehouse building on the Muscle Shoals reservation with no bat or suitable roosting structures for the bat in the building (Personal Communication, Piper Roby, Copperhead Consulting). Acoustic detectors subsequently operated by TVA staff near the presumed roosting area for several days did not record any Indiana bat (or northern long-eared bat) calls. These observations support the idea that any use of the MSR by Indiana bats is temporary and likely only to occur during spring and fall migration.

The northern long-eared bat (NLEB) predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring, they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, NLEBs roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees. Roost selection by the NLEB is similar to that of Indiana bat, however NLEBs are thought to be more opportunistic in roost site selection. This species also roosts in abandoned buildings and under bridges. NLEBs emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (USFWS 2014). The nearest NLEB is known from summer mist-net capture site approximately 13.24 miles from the Project Area.



Tricolored bats hibernate in caves or man-made structures such as culverts or bridges (Fujita and Kunz 1984, Newman et al. 2021). During the summer, tricolored bats roost in clumps of tree foliage, often in oak and hickory trees (Veilleux et al. 2003, O'Keefe et al. 2009, Schaefer 2017, Thames 2020). Foraging studies of tricolored bats are lacking, but it is believed they typically forage near their roost trees in forested areas and riparian corridors. Two tricolored bats were captured on the MSR during mist net surveys in 2007 at a location approximately 1.37 miles from the Project Area (TVA 2007).

The wooded sections on the perimeter of the Project Area and ornamental trees proposed for removal as part of the Proposed Action was assessed for potential summer roosting and foraging sites for state and federally listed bat species following the Range Wide Indiana Bat and NLEB Survey Guidelines (USFWS 2023b). Trees on the perimeter of the Project Area do provide suitable summer roosting and foraging habitat for Indiana bat, northern long-eared bat, and tricolored bat. However, none of these areas would be impacted by the preferred Action Alternative. Up to 10 trees are proposed for removal under Alternative A, of which 4 (0.36 acres) provide suitable summer roosting habitat for tri-colored bat, NLEB, and Indiana bat. Tree removal is proposed to begin in February 2024 when Indiana bats, NLEBs, and tricolored bats are inactive. Removal of suitable habitat during this timeframe would avoid direct impacts to these species as bats are roosting underground at that time. Aquatic foraging habitat is present within the Project Area when intermittent streams and wet weather conveyances are full. No permanent bodies of water would be impacted. Impacts to ephemeral streams within the Project Area would be minimized by the implementation of BMP's.

A number of activities associated with the Proposed Action, including tree removal, were addressed in TVA's programmatic consultation with the U.S. Fish and Wildlife Service on routine actions and federally listed bats in accordance with ESA Section 7(a)(2) and completed in April 2018 and updated in May 2023. For those activities with the potential to affect bats, TVA committed to implementing specific conservation measures. These activities and associated conservation measures are identified on pages 5 and 6 of the TVA Bat Strategy Project Screening Form (Appendix B) and would be reviewed and implemented as part of the Proposed Action. Considering the scope of the Proposed Action, distance to known bat records, and implementation of conservation measures, including winter tree removal, impacts to gray bat, are not anticipated, and impacts to NLEB's may occur but are not likely to adversely affect this species due to lack of post-white-nose syndrome records nearby. Impacts to Indiana bat may affect the species due to summer habitat removal but adverse impacts would be minimized as a result of the Action Alternative. The Proposed Action would not jeopardize the continued existence of the tricolored bat.

Alligator snapping turtle are an almost entirely aquatic turtle. Only nesting females are known to leave the water. Alligator snapping turtles use large, deep bodies of water such as lakes, rivers, and deep sloughs. They are often found among submerged logs and root snags in areas with muddy substrate (Buhlmann et al. 2008). The closest record of alligator snapping turtle is approximately 0.58 miles away. No suitable habitat for Alligator snapping turtle exists in the Project Area; therefore, this species would not be impacted by the Proposed Action.

### Managed and Natural Areas

Managed areas include lands held in public ownership that are managed by an entity (e.g., TVA, US Department of Agriculture, US Forest Service, State of Alabama) to protect and maintain certain ecological and/or recreational features. Natural areas include ecologically significant sites; federal, state, or local park lands; national or state forests; wilderness areas; scenic areas; wildlife management areas; recreational areas; greenways; trails; NRI streams; and wild and scenic rivers. Natural areas include TVA and non-TVA managed areas, ecologically significant sites and Nationwide Rivers Inventory streams. Nationwide Rivers Inventory streams are free-flowing segments of rivers recognized by the U.S. National Park Service as possessing outstandingly remarkable natural or cultural values. Ecologically significant sites are either tracts of privately owned land that are recognized by resource biologists as having significant environmental resources or identified tracts on TVA lands that are ecologically significant but not specifically managed by TVA's Natural Areas program. A review of the TVA Natural Heritage Project database identified 13 managed and natural areas within three miles of the Project Area (Table 5).

**Table 5. Managed and Natural Areas that occur within, adjacent to, or within 3 miles of the Muscle Shoals Reservation Complex D Project Area.**

| Managed and Natural Areas                                       | Acres    | County          | State |
|---|----------|-----------------|-------|
| McFarland Park  | 302.53   | Lauderdale (AL) | AL    |
| Muscle Shoals Reservation                                       | 2427.5   | Multiple        | AL    |
| Wilson Dam Reservation  | 245.41   | Multiple        | AL    |
| Wildwood Park   | 286.64   | Lauderdale (AL) | AL    |
| Old First Quarters TVA Small Wild Area                          | 26.17    | Multiple        | AL    |
| Florence Municipal Park   | 72.45    | Lauderdale (AL) | AL    |
| Wilson Dam Tailwater Restricted Mussel Harvest Area             | 1365.5   | Multiple        | AL    |
| Seven Mile Island State Wildlife Management Area                | 6035.31  | Multiple        | AL    |
| Muscle Shoals National Recreation Trail                         | 48.65    | Multiple        | AL    |
| River Heritage Park   | 26.59    | Lauderdale (AL) | AL    |
| Veterans Park   | 95.7     | Lauderdale (AL) | AL    |
| Tennessee River/Wilson Dam Nonessential Experimental Population | 4692.18  | Multiple        | AL    |
| Key Cave Aquifer Hazard Area                                    | 10348.15 | Lauderdale (AL) | AL    |

Of the managed and natural areas that occur within 3 miles of the Project Area, five of these natural areas could be directly impacted by the Proposed Project. The Project Area overlaps with two areas and is adjacent to one area: Muscle Shoals Reservation (TVA

Asset), Muscle Shoals National Recreation Trail (Figure 7), and Old First Quarters TVA Small Wild Area (0.1 mile north). The Tennessee River/Wilson Dam Nonessential Experimental Population and the Wilson Dam Tailwater Restricted Mussel Harvest Area are located 0.4 miles north of the Project Area (Figure 8). Given their distance from the Project Area and the nature of the Proposed Project, no direct impacts to the remaining natural areas are expected.

The adoption of the Project Action would include the demolition of the OSW and MSMB, along with the relocation of the existing Boat Shed. Muscle Shoals Reservation, Muscle Shoals National Recreation Trail, and Old First Quarters TVA Small Wild Area would be temporarily impacted during deconstruction and construction of new facilities, as proposed in Alternative A. The use of Standard BMPs would minimize these impacts.

Two unique aquatic habitat areas (Wilson Dam Tail Water Restricted Mussel Harvest Area and Tennessee River/Wilson Dam Nonessential Experimental Population Area) are located approximately 0.4 miles north of the proposed development site. TVA would coordinate with land managers to minimize impacts further. No long-term impacts to the Mussel Nonessential Population or the Restricted Harvest areas are expected.

Other recreation areas within close proximity of the Project Area include Veterans Park, McFarland Park, Wildwood Park and Florence Municipal Park (Table 5). Cypress Creek from river mile (RM) 5, west of Florence to RM 25 at the Tennessee state line is listed on the Nationwide Rivers Inventory for its scenery and recreational value (National Park Service 2023). Under a 1979 Presidential Directive and related CEQ procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more Nationwide Rivers Inventory segments. Cypress Creek is located across the Tennessee River, 4.9 mi northeast of the proposed Project Area.

### **Parks and Recreation**

The Muscle Shoals/Wilson Dam Reservation is a regionally significant recreation and open space resource that attracts users from within and outside of the nearby communities. Recreational use opportunities on the Reservation, largely outside the MSR study area and north of Reservation Road, include walking, jogging, bicycling, hiking, fishing, power and nonpower boating, wildlife and nature observation, and picnicking.

The Muscle Shoals Trail Complex, designated as a National Recreation Trail by the Secretary of the Department of the Interior, includes a total of approximately 15 miles of trails. Major elements of the complex include an 8-mile-long paved trail, designed to accommodate walking, jogging, and bicycling, that generally parallels Reservation Road and approximately 7 miles of unpaved foot trails. Unpaved foot trails include the Rockpile Hiking Trail that parallels the Tennessee River (Wilson Dam tailwater), the Southport Historical Trail, the Old First Quarters Small Wild Area Trail, and an exercise trail. Both the Rockpile and Old First Quarters Small Wild Area trails were originally built by the Civilian Conservation Corps (CCC) in the 1930s. A central parking area and restrooms have been built at the trailhead by TVA to accommodate users of the trail complex. Although the trail complex on the Muscle Shoals/Wilson Dam Reservation carries the National Recreation Trail designation, its continuing management and maintenance are the responsibility of TVA (Figure 7).

## MSR Trail Complex -Trail Heads & Routes



**Figure 7. Map of the Muscle Shoals Trail Complex near the Complex D facility**

The Muscle Shoals Trail Complex also connects to the CCC park and pavilion area, located just north of the trail complex parking lot. The CCC park and pavilion area includes a parking lot, playground area, pavilion, and connects to the Muscle Shoals Trail Complex trail system overlooking the Tennessee River.

The Muscle Shoals Trail Complex also connects to a network of off-reservation trails. It connects and enhances the City of Sheffield's Rails to Trails project on the south side of the Tennessee River and the City of Florence's River Heritage Trails on the north side. These trails are linked by a pedestrian/bikeway crossing of the river via the Patton Island Bridge (also known as Singing River Bridge). Combined, these trails make it possible to travel by nonmotorized means to and from several locations within the Florence, Muscle Shoals, and Sheffield communities.

While the majority of MSR recreational use takes place north of Reservation Road and outside the boundaries of the proposed MSR study area, sections of two trails, which are part of the National Recreation Trails Complex, are located within this area. These include two segments of the paved walk/bike trail along Reservation Road and a MSR Complex D Consolidation EA section of the Rockpile Hiking Trail along the Tennessee River. Alabama Birding Trail site number 8 is also located on the Muscle Shoals Trail system, off Reservation Road adjacent to the project area.

Wilson Dam Reservation is approximately 400 acres of land, which adjoins the northeastern boundary of the MSR and lies on both sides of the Tennessee River. This area serves

primarily to protect the integrity of the dam itself, while also affording recreational use to the public. It also includes recreation facilities developed and maintained by TVA. Veterans Park is located on the north side of the river and is under a permanent recreation easement to the City of Florence, occupies a portion of this reservation.

In addition to portions of the paved trail and the eastern section of the Rockpile Hiking Trail, Wilson Dam Reservation south of the river includes the Rockpile Recreation Area that provides overnight camping and day use activities, including bank fishing, a playground area, and a boat launching ramp that provides access to the river (Wilson Dam tailwater). There is also a boat launching ramp in Fleet Hollow on the eastern edge of Wilson Dam Reservation that provides access to the waters above Wilson Dam. The Tennessee River (Wilson Dam tailwater) that defines the northern boundary of the MSR is also a highly valuable recreation resource. Its waters receive heavy boating and bank fishing use, and the area is a renowned recreational fishery.

McFarland Park is a 327-acre public park located along the north side of the Tennessee River in Lauderdale County and is host to numerous festivals and special events. McFarland Park is located north of the project area, on the opposing bank of the Tennessee River. This park is managed by the City of Florence Parks and Recreation, and it features playgrounds, lighted walking trails, a floating restaurant, lighthouse, beach area, picnic tables, boat slips, boat ramp, and camping facilities. McFarland Park is a popular destination year-round for bass fishing tournaments, and an invaluable eco-tourism asset to the City of Florence.

West of the Muscle Shoals Reservation complex lies Sheffield's River Front Park. River front park is owned and operated by the City of Sheffield and is a popular destination for those visiting the Shoals area. The park lies along one mile of shoreline, and hosts variety of recreational activities, including a boat launch, fishing piers, docking facilities, walking trails, bicycle path, splash pad, special needs playground restrooms.

Veterans Park is a 95-acre public park located across the Tennessee River on Wilson Dam Reservation lands in Lauderdale County adjacent to Wilson Dam and is located northeast of the project area. This park is owned by TVA and managed by the City of Florence Parks and Recreation under a permanent recreation easement. It features playgrounds, tennis courts, softball fields, picnic shelters, a disc golf course, and campsites.

Seven Mile Island State WMA, located west of the project area, is approximately 4,700 acres of public land in Lauderdale County that consists of a maze of islands, shallow water, sloughs, wetlands, swamps, riverine forests, cliffs, caves, agricultural lands, and reverting agricultural lands. This WMA is owned by TVA but is under easement to and managed by ADCNR Division of Game and Fish for waterfowl hunting and other recreational activities such as hiking and camping (Figure 8).



## TVA Recreation Areas



**Figure 8. Map of the recreation areas near the TVA Muscle Shoals Complex D facility**

Located west/southwest of the MSR complex are three smaller parks owned and operated by the City of Sheffield. These smaller parks include York Terrace Park, Tri Cities Park, and 10th Avenue Park. These parks are mainly connected to smaller neighborhoods in the area, and include a variety of resources including playgrounds, picnic tables, and green spaces.

Under the Proposed Action, indirect impacts would occur on the MSR recreational trails during demolition and relocation of facilities. These impacts would mainly consist of noise and transportation effects during project commencement until project completion. It is important to note that a portion of the TVA trail lies directly on the entrance where demolition and relocation equipment will be moved to and from the project site, off Reservation Road. While this portion of the trail does not need to be closed during project construction, appropriate safety measures should be taken to make workers and trail users aware. Indirect impacts could occur on other recreation areas within 1 miles of the project, including intermittent noise and transportation effects to and from recreational areas, which would be minimized using standard construction BMPs. Due to the nature of the project, no significant long-term impacts to these recreational areas are expected.

#### **Cultural Compliance – Archeology and Historical Architecture**

TVA completed a desktop review of the undertaking's area of potential effects (APE) to identify any historic properties located in the affected area, and to assess potential for unidentified properties. The review included the following sources: TVA's Cultural Resources Management System (CRMS); current and historic editions of the Florence, AL (1936, 1958, 1966, and 1972 editions) and Killen, AL (1936, 1957, and 1973 editions) 7.5-

minute topographic quadrangle, and other historic maps; historic aerial photographs available at the U.S. Geological Survey (EarthExplorer); U.S. Soil Conservation Service Web Soil Survey (WSS); NRHP listings; the Alabama Register of Landmarks and Heritage viewers; the Alabama Online Cultural Resource Database (OCRD); and previous survey reports. TVA also completed a reconnaissance of the Project Area to assess the APE for archaeological sites and the project's potential visual effects on any historic architectural resources in the viewshed.

The 1936 edition of the USGS Florence, AL quadrangle indicates that a CCC park and pavilion area was built in the APE soon after TVA's acquisition of the property, with an entrance on Reservation Road. However, by 1957 the camp had been removed and a large building constructed in its place. This building is labelled "DRP Warehouse & Maintenance Shop" on a 1968 map (reprinted in Haldimann n.d.:57; Figure 8).

The APE is within a historic district that TVA and the Alabama State Historic Preservation Officer (SHPO) consider eligible for inclusion in the National Register of Historic Places (NRHP). The historic district's boundary was originally defined as all TVA-owned property on the MSR. Subsequently, due to land disposal activity both the reservation boundary and the size of the historic district have been reduced. A 2011 Memorandum of Agreement (MOA) between TVA and AL SHPO concerning the proposed land disposal project (and 2013 amended MOA) excluded the current affected area from the historic district. A 2002 study (Pietak et al. 2002) recommended the OSW building (which they referred to as the "TVA Support/Maintenance Building") was eligible for listing in the NRHP under Criterion A due to its association with TVA's activities in Muscle Shoals between 1933 and 1970. However, after completing a study of properties in the land disposal APE in 2010 TVA determined in consultation with SHPO that this building and all other buildings in Complex D are ineligible.

Some of the historic district's contributing buildings are less than one-half mile from the proposed new buildings, but none would have clear views of the new construction due to topography and the thick stand of vegetation that surrounds all of Complex D with the exception of the driveway entrance. Therefore, there are no historic architectural properties listed in, or eligible for listing in the NRHP within the undertaking's APE.

Two previous archaeological surveys (Pietak et al. 2002, Shaw 1994), included areas around the outer edge of Complex D, but both surveys excluded the developed portions of Complex D. No archaeological sites have been identified previously within the APE.

Although Complex D is outside of the historical munitions and fertilizer production areas, it has been affected by multiple episodes of past construction. Additional lines of evidence document that the entire project footprint has been reshaped by past construction activities including excavation and cut and fill activity. For example, digital elevation maps available from the USGS show that contours have been smoothed, with push piles or berms along the southern borders of the Complex D area. Evidence of this was noted during the field reconnaissance.

Observations made during the reconnaissance indicate that little if any native soil remains in the project footprint, and that most if not all of the Complex D area is occupied by either compacted subsoil or construction fill. In addition, given the upland setting, the potential for archaeological deposits buried more deeply than the current surface is very low. The proximity to the proposed water line to Reservation Road indicates it was likely affected by

road construction and the installation of the water line would be consistent with item B-10 in Appendix C of TVA's Section 106 programmatic agreement (TVA 2019c). This item describes "repairing underground utilities in the documented area of disturbance". Based on the desktop review and reconnaissance, TVA finds that the project footprint lacks potential for intact archaeological sites.

TVA consulted with the Alabama SHPO and federally recognized Indian tribes regarding the absence of historic properties in the APE. The SHPO concurred on June 28, 2023. None of the consulted tribes replied by the end of the 30-day comment period. No historic properties would be affected by TVA's decision to choose Alternative B, as TVA has determined in consultation with the Alabama SHPO and federally recognized Indian tribes that the APE lacks historic properties.

### **Soil Erosion and Surface Water**

The Project Area is regulated for stormwater flow under the National Pollutant Discharge Elimination System (NPDES) permit AL0003891. Monthly reports, referred to as discharge monitoring reports (DMRs) are submitted to the Alabama Department of Environmental Management (ADEM) as required by this permit. Contaminants of concern that are sampled and reported reflect activities at the site. As the project area consists of office space with some minor maintenance activities, the contaminants that are evaluated are more to gauge water quality sheet flowing across parking lots and potential contaminants that would be associated with employee parking. Hence, oil and grease and total suspended solids are some of the reported values.

During demolition and construction activities, it is expected that there would be ground disturbance in the Project Area exceeding one acre. The CWA and other federal regulations require construction site operators to obtain NPDES permit coverage for regulated land disturbances and associated discharges of stormwater runoff to State waters.

Effective April 1, 2011, ADEM established General NPDES Permit No. ALR100000 for discharges associated with regulated construction activity that would result in land disturbance equal to or greater than one acre or from construction activities involving less than one acre and which are part of a common plan of development or sale equal to or greater than one acre. Construction site operators / owners seeking coverage under this general permit must submit a Notice of Intent (NOI) in accordance with the permit requirements.

Operators / owners of all regulated construction sites must implement and maintain effective erosion and sediment controls in accordance with a Construction Best Management Practices Plan (CBMPP) prepared and certified by a Qualified Credentialed Professional (QCP). The CBMPP must be submitted to ADEM for review along with the NOI. BMPs outlined in the CBMPP would be expected to include methods to control dust and soil erosion. Such methods that are normally employed would include actions such as watering roads and project areas, tarping trucks and gravel entrance and exist areas. Additionally, a plan would note methods of protection of existing stormwater drains and general BMPs to prevent the mobility of soil from the Project Area.

Although the Proposed Action may temporarily disrupt the stormwater sheet flow during the demolition and construction phases, the flow is expected to be re-established in the same manner utilizing existing stormwater outlets at the completion of the project. As such, minimal and temporary impacts to surface water would be expected.



### **Air Quality**

The Clean Air Act (CAA) regulates the emission of air pollutants and, through its implementing regulations establishes National Ambient Air Quality Standards (NAAQS) for several “criteria” pollutants that are designed to protect the public health and welfare with an ample margin of safety. The criteria pollutants are ozone, particulate matter, carbon monoxide (CO), nitrous oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and lead. There are two types of NAAQS: primary standards (set to protect public health) and secondary standards (set to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation and buildings). Specified geographic areas are designated as attainment, nonattainment or unclassifiable for specific NAAQS. Areas with ambient concentrations of criteria pollutants exceeding the NAAQS are designated as nonattainment areas and new emissions sources to be located in or near these areas are subject to more stringent air permitting requirements. The air quality in Colbert County, AL meets applicable federal and state air quality standards and is in attainment with applicable NAAQS (USEPA 2016) and ambient air quality standards referenced in the ADEM Administrative Code, Title 335-3 (ADEM Administrative Code 2016). The MSR is subject to both federal and state regulations. These regulations impose permitting requirements and specific standards for expected air emissions. The standards and regulations that pertain to the centers include ADEM Administrative Code, 335-3-4-.02 Fugitive Dust and Fugitive Emissions.

Transient air pollutant emissions would occur during the construction phase. Construction related air quality impacts would primarily result from site preparation and the operation of construction vehicles and equipment and worker personnel vehicles. The daily workforce during construction is expected to be approximately 30 workers. Combustion of gasoline and diesel fuels by internal combustion engines (vehicles, generators, construction equipment, etc.) would occur during construction and would generate local emissions of particulate matter, NO<sub>x</sub>, CO, volatile organic compounds (VOC) and SO<sub>2</sub>. These emissions would be small and would result in negligible impacts to air quality.

Site preparation and vehicular traffic over paved and unpaved roads at the site also would result in the emission of fugitive dust during active construction periods. Based on analyses conducted at other construction sites, it is expected that the largest contribution (greater than 95 percent by weight) of fugitive dust emissions would be deposited within the construction site boundaries. To minimize air impacts, TVA requires all contractors to keep construction equipment properly maintained and to use BMPs (such as covered loads and wet suppression) to minimize fugitive dust. Air quality impacts from construction activities would be temporary (11 to 18 months) and would depend on both man-made factors (intensity of activity, control measures) and natural factors such as wind speed and direction, soil moisture, etc. However, even under unusually adverse conditions, these emissions from construction activities would have at most, a minor transient impact on air quality and would be well below the applicable ambient air quality standards. Overall, the potential impacts to air quality from construction related activities on local and regional air quality would be minimal.

### **Climate Change**

“Climate change” refers to any substantive change in measures of climate, such as temperature, precipitation, or wind. The 2018 National Climate Assessment concluded that global climate is projected to continue to change over this century and beyond. The amount of warming projected beyond the next few decades, by these studies, is directly linked to the cumulative global emissions of greenhouse gasses (GHG) (e.g., CO<sub>2</sub>, methane) and

particles. The 2018 National Climate Assessment concluded that by the end of this century, a 3° Fahrenheit (F) to 5°F rise can be projected under the lower emissions scenario and a 5°F to 10°F rise for a higher emissions scenario (Melillo et al. 2014).

Temperature trends in the southeast over the period of 1895 to 2011 are found to be statistically insignificant for any season. In the southeast, the number of extreme hot days has tended to decrease or remain the same, while the number of very warm summer nights has tended to increase. The number of extreme cold days has tended to decrease. Global warming is a long-term trend, but that does not mean that every year will be warmer. Day-to-day and year-to-year changes in weather patterns will continue to produce variation, even as the climate warms. Generally, climate change results in Earth's lower atmosphere becoming warmer and moister, resulting in the potential for more energy for storms and certain severe weather events. Trends in extreme rainfall vary from region to region. Generally, Muscle Shoals, AL experiences a temperate climate with adequate rainfall throughout the year, hot and humid summers and cool, damp winters. The GHG emissions associated with the Unit D Consolidation Project would be similar to current conditions and would not create a new impact on climate change.

### **Geology**

MSR is located in the Interior Low Plateau physiographic province along the southwestern flank of the Nashville Dome. Mississippian age bedrock is present beneath the site and generally dips to the south-southwest at about 25 to 30 feet per mile across the region, except where modified by local folding. Fractures and joints are well developed in the Mississippian bedrock of the area, as observed along the southern bluff of the Tennessee River. Inspection of fractures and joints in these outcrops show two dominant joint directions N25-60°E and N50-70°W.

The site is underlain by residuum derived from weathering of the bedrock and is approximately 40 to 100 feet thick. Weathering has produced a layer of material above bedrock, referred to as the epikarst zone, which consists of partially weathered bedrock. The bedrock surface beneath the epikarst zone is irregular and contains void spaces where residuum has been washed into the bedrock.

The Tuscumbia Limestone and the Fort Payne Chert comprise a major regional aquifer system in northwestern Alabama. The Tuscumbia Limestone, a light grey fossiliferous limestone, is the uppermost bedrock unit beneath the site with a thickness of approximately 50 feet. Beneath this unit is the Fort Payne Chert, a light grey crystalline limestone containing abundant chert. The Chattanooga Shale is found beneath the Fort Payne Chert and is a regional bedrock marker.

The Proposed Action would be within areas that have been previously disturbed and reworked and would be limited to the near surface. Thus, no impacts to geology are anticipated from the Proposed Action

### **Groundwater**

Groundwater occurrence at the site is found within both the epikarst zone and upper bedrock at depths between approximately 10 to 100 feet below ground surface. Recharge to the aquifers is from infiltration of precipitation at ground surface which moves vertically

downward through the overburden and drains into the epikarst zone and upper bedrock. Lateral movement in the epikarst and upper bedrock is expected to follow routes through enlarged fractures having orientations correlated with joint trends. Groundwater flow is generally towards the northwest and ultimately discharges to the Tennessee River.

The Proposed Action would likely not encounter groundwater and groundwater wells would not be installed as part of the Project. Wells should not be installed, and potable water should be obtained from the local municipal source. Thus, no impacts to groundwater are anticipated from the Proposed Action.

### **Noise**

Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB. Noise levels are computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by the USEPA and has been adopted by most federal agencies (USEPA 1974). A DNL of 65 A-weighted decibels (dBA) is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities such as construction. The A-weighted sound level represents the approximate frequency response characteristic of the average young human ear. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by USEPA as a level below which there is no adverse impact (USEPA 1974).

Direct and indirect noise impacts associated with implementation of the preferred Action Alternative would primarily occur during construction. Construction equipment produces a range of sounds while operational. Noisy construction equipment, such as delivery trucks, dump trucks, water trucks, service trucks, chain saws, skidders, bulldozers, tractors, and/or low ground-pressure feller-bunchers, produce maximum noise levels at 50 feet of approximately 84 to 85 dBA. This type of equipment may be used for approximately 24 to 36 months with the Project Area. Construction noise would cause temporary and minor adverse impacts to the ambient sound environment around the Project Site vicinity. The facilities and activities that already take place within MSR Complex D likely produce ambient sounds that are at or higher than the typical 45 to 55 dBA in the Project Area, and these existing noises would help make effects from the Project more minimal. Additionally, construction would primarily occur during daylight hours, between sunrise and sunset; therefore, the Project would not affect ambient noise levels at night during most of the construction period. Most of the proposed equipment would not be operating on site for the entire construction period but would be phased in and out according to the progress of the Project.

### **Solid and Hazardous Materials**

The Resource Conservation and Recovery Act (RCRA) creates the framework for the proper management of hazardous and non-hazardous solid waste. The law describes the waste management program mandated by Congress that gave EPA authority to develop the RCRA program. State authorization is a rulemaking process where EPA delegates the primary responsibility of implementing the RCRA hazardous waste program to individual

states in lieu of EPA. This process ensures national consistency and minimum standards while providing flexibility to states in implementing rules.

In Alabama, ADEM is authorized by EPA to regulate solid and hazardous waste from initial generation through final disposal commonly referred to as “cradle to grave”.

Until the late 1980s, much of the experimental work performed on the MSR involved fertilizer research. Later, the focus turned toward innovative environmental research related to remediation, alternative power generation, and sustainability. In support of these new missions, TVA applied for a RCRA permit which would allow for experimentation on various hazardous waste streams. As a part of the permitting process, the MSR was subjected to a series of RCRA facility inspections, followed by extensive sampling and corrective actions to address legacy disposal practices associated with former industrial activities at the site. A number of Solid Waste Management Units (SWMUs) and Area of Concerns (AOC) were identified during the course of the RCRA process. Currently, there are 216 SWMUs and 4 AOCs addressed in the TVA Environmental Research Center’s (ERC) RCRA permit.

A SWMU is defined in the TVA Permit as follows, “any unit which has been used for the treatment, storage, or disposal of solid waste at any time, irrespective of whether the unit is or ever was intended for the management of solid waste. RCRA-regulated hazardous waste management units are also solid waste management units. SWMUs include areas that have been contaminated by routine and systematic releases of hazardous waste or hazardous constituents, excluding one-time accidental spills that are immediately remediated and cannot be linked to solid waste management activities (e.g., product or process spills)” (ADEM, Hazardous Waste Facility Permit, September 28, 2012, Part 1, § I.D, pg. 8 of 9)

Although all the land at Complex D is regulated under the ERC RCRA permit, only a single SWMU, 203 is located within the Project Area. SWMU 203, Paint Shop Wastewater Sump is a 1000 gallon underground concrete tank located on the north side of the old paint shop adjoining the OSW. The septic tank was installed in the 1970s to receive wastewater from painting cleanup activities associated with the paint shop. The area was closed in the 1990s and was remediated under an interim measures plan and no further action was required. Under the requirements of the ERC RCRA permit, TVA is required to provide advanced notification of any planned activities or alterations to any SWMU. This area is not expected to be disturbed by the Proposed Action; however, it is located in close proximity.

The ongoing operations at the Complex D facilities generate typical wastes from maintenance activities that include oily wastes, paint waste, lighting waste and batteries. The OSW/MPB (AL 4640090003) and the MSMB (AL3640090012) are registered as Very Small Quantity Generators (VSQG), meaning that each generate less than 220 pounds of hazardous waste in a calendar month. The OSW/MPB also has a storage area for universal waste light bulbs.

A regulated materials assessment would need to be completed prior to any structural demolition to identify materials that would need special handling and disposal, most notably asbestos. The types of wastes that are expected to be generated during demolition would

include asbestos waste (friable and nonfriable), lighting waste, electrical equipment, surplus outdated chemicals, construction and demolition debris and recyclable metal. All non-hazardous wastes and unusable soils would be shipped offsite for disposal to Republic's Morris Farms. Any hazardous wastes would be managed offsite to a TVA approved disposal location properly permitted to manage and disposal of such wastes. Offsite borrow material is not anticipated, however, if clean borrow is needed, then such material would be obtained from an approved TVA offsite borrow site. It is estimated that approximately 1,000 cubic yards of waste material would be generated from demolition activities requiring shipment offsite. This would equate to approximately 50 truckloads.

**Transportation**

This section describes roadways and other transportation infrastructure serving the Project Area and surrounding area, and potential impacts on transportation that would be associated with the preferred Action Alternative.

The Project Area is located within the city of Sheffield and adjacent to the city of Muscle Shoals, Alabama. The area is largely urbanized and characterized by nearby residential and industrial areas. Complex D is located within the larger MSR where numerous industrial operations are in service. One nearby industrial facility is the Occidental Chlor-Alkali Manufacturing Facility, which is located southwest of the Project Area, on the east side of Reservation Road. The closest airport is the Northwest Alabama Regional Airport, located approximately 2.7 miles southeast of the Project Area.

There are two existing Alabama Department of Transportation (ADOT) stations immediately adjacent to the Project Area to provide traffic volume on Reservation Road. ADOT traffic count data was obtained using the ADOT Enhanced Alabama Roadway Information Management System (E-TRIMS). The values provided are annual average daily traffic (AADT) volumes. AADT volumes are based on 24-hour, two directional counts at a given location. The raw traffic data is mathematically adjusted for vehicle type, determined by an axle correction factor. The data is then statistically corrected by seasonal variation factor that considers time of year and day of the week. Reservation Road AADT includes 1,823 vehicles/day to the south and 1,948 vehicles/day to the northeast of the Complex D entrance.

Under the preferred Action Alternative, the construction and consolidation of the Complex D facility would have no effect on operation of the nearby Northwest Alabama Regional Airport, located approximately 2.7-miles east of the Project Area, across North Wilson Dam Road. The distance between the regional airport and the proposed facility consolidation, coupled with the existing industrial development and nearby roadways, serve to minimize any effects the proposed construction may have on air traffic. The operation of this industrial facility would not affect commercial air passenger or freight traffic in the region.

During construction period at the facility, a maximum of 30 workers would be present at the site from 7am to 5pm, 6 days a week (Monday through Saturday) for approximately 10 - 18 months. A majority of the workers would likely come from the local or regional area, and approximately 40 percent of the workforce would be supervisory personnel that would likely come from out-of-state, and many would stay in local hotels near or within the Sheffield/Muscle Shoals area. Workers would either drive their own vehicles or carpool to the Project Area. Parking would be on site during the day. Some work teams may visit local restaurants and businesses during work hours.

Additional traffic due to deliveries and waste removal would consist of a maximum of 50 vehicles per day during construction. Traffic flow around the work site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. All deliveries and workers would access the Project Area from Reservation Road. No major industries are located at the site access point. Should traffic flow be a problem for local residences or businesses, TVA would consider staggered work shifts to space out the flow of traffic to and from the Project Area. Use of such mitigation measures would minimize potential adverse impacts to traffic and transportation to less than significant levels.

No long-term impacts to transportation are anticipated from the Proposed Action. The proposed updates to Complex D would not change transportation patterns once it returns to normal operation. Therefore, the operation of the facility would not have a noticeable impact on local roadways. Overall, the Proposed Action would not result in indirect impacts to transportation. Should substantial traffic occur near the Project Area access locations, TVA, or its contractor, would implement staggered work shifts to assist traffic flow near the Project Area access locations to minimize potentially adverse impacts to traffic and transportation levels.

### **Visual Resources**

This assessment provides a review and classification of the visual attributes of existing scenery, along with the anticipated attributes resulting from the preferred Action Alternative. The classification criteria used in this analysis are adapted from a scenic management system developed by the US Forest Service (USFS) and integrated with planning methods used by TVA. The classification process is also based on fundamental methodology and descriptions adapted from *Landscape Aesthetics, A Handbook for Scenery Management*, Agriculture Handbook Number 701 (USFS 1995).

Scenic resources within a landscape are evaluated based on a number of factors that include scenic attractiveness, integrity and visibility. Scenic attractiveness is a measure of scenic quality based on human perceptions of intrinsic beauty as expressed in the forms, colors, textures and visual composition of each landscape. Scenic integrity is a measure of scenic importance based on the degree of visual unity and wholeness of the natural landscape character. The varied combinations of natural features and human alterations both shape landscape character and help define their scenic importance. The subjective perceptions of a landscape's aesthetic quality and sense of place is dependent on where and how it is viewed. For this analysis, the affected environment is considered to include the entire Project Area, as well as the physical and natural features of the landscape around it.

Scenic visibility of a landscape may be described in terms of three distance contexts: foreground, middleground and background. In the foreground, an area within 0.5 miles of the observer, individual details of specific objects are important and easily distinguished. In the middleground, from 0.5 to 4 miles from the observer, object characteristics are distinguishable, but their details are weak, and they tend to merge into larger patterns. In the distant part of the landscape, the background, details and colors of objects are not normally discernible unless they are especially large, standing alone, or have a substantial color contrast. In this assessment the background is measured as 4 to 10 miles from the observer. Visual and aesthetic impacts associated with a particular action may occur as a result of the introduction of a feature that is not consistent with the existing viewshed.

Consequently, the character of an existing site is an important factor in evaluating potential visual impacts.

Most of the area encompassing the area around MSR Complex D includes a naturally appearing landscape that shows little evidence of human alteration. The composition of vegetation and the patterns of vegetation are the prominent features and consist of a variety of deciduous trees, shrubs and herbaceous plants. Scenic attractiveness in this area is common, scenic integrity is generally high and scenic visibility is moderate to high. The number of available views of this site are low and limited to passing motorists on Reservation Road. However, this site is also viewed by pedestrians and other users of the recreational trails, who place a high value on the attractiveness of the area. The overall scenic value class for this area is good.

Complex D itself is an area with industrial landscape character. Scenic attractiveness is minimal as any remaining vegetation consists of maintained turf and landscape plantings or sparse groupings of emerging woody vegetation. The scenic integrity is generally very low as landforms and vegetation patterns have been heavily altered and the built environment dominates the landscape. The scenic visibility has a low sensitivity, where the number of views is restricted to those driving along Reservation Road to the east. This area has an overall poor scenic value class.

Under the preferred Action Alternative, during the construction phase of the new facility, there would be some visual discord from the existing conditions due to an increase in personnel and equipment in the area. Impacts from additional vehicular traffic are expected to be minor as the roads are already predominantly used for industrial related activity. This increase in visual discord would be temporary and only last until construction is completed. Industrial development of all or a portion of the site under this alternative would adversely impact existing scenic resources. Removal of existing trees, site grading and surfacing would slightly reduce the scenic integrity of the site as it would reduce the naturally appearing landscape character. Under this alternative, there would be an inconsequential visual change in the landscape at the foreground viewing distance due to the alteration of the industrial development. The greatest impact would be experienced by users of the Reservation Road Trail, however, the removal of the small number of trees within the complex would not adversely impact the aesthetic quality of this portion of the trail. TVA recognizes the importance of this trail and aesthetic qualities that its forested corridor provides to the trail users. Therefore, as an impact minimization measure, TVA would not pursue the clearing of any vegetation outside of the Project Area and up to 10 trees would be removed within the Project Area.

Permanent impacts would include minimal discernible alterations visible in the foreground of the new facility along either Reservation Road or the recreational trail that passes through the site. These minor visual obtrusions would be minimized with the retention of a forested buffer between the trail and the Project Area. By infilling with supplemental landscaping, the main building would appear situated within the current forested area. The retention of a vegetative buffer, in combination with limiting new roadway intersections (i.e., curb cuts) would reduce the potential for disturbance and maintain the park-like setting for viewers using recreational trails located near Complex D. In more distant views, the buildings would likely merge with the existing surrounding industrial development and any visual intrusions would be buffered by the surrounding vegetation. Overall, the construction,



operation and maintenance of the new facility would have minor visual impacts for area residents, motorists, recreational users and TVA employees and visitors.

### **Socioeconomics and Environmental Justice**

This section describes an overview of existing socioeconomic conditions and environmental justice considerations that would be associated with the Proposed Action. Pertinent EOs on Environmental Justice direct Federal agencies to consider the impacts of their actions on minority and low-income populations and to avoid disproportionate impacts to those populations. While EO 12898, 14008 and 14096 do not create obligatory requirements for TVA, TVA evaluates potential environmental effects on environmental justice communities through appropriate NEPA analysis for proposed federal projects.

Based on U.S. Census data available through the EPA's EJSCREEN (Version 2.11), 595 people live within a one-mile radius of the Project Area, approximately 0.01 percent of the Colbert County, AL population of 54,957 people. Tables 6 and 7 below provide a breakdown of relevant population, income, and poverty data. Since the proposed Project Area falls immediately adjacent to Muscle Shoals city limits, Muscle Shoals population, income, and poverty data are provided for comparison and reference.

**Table 6. Project Site Population**

| <b>Muscle Shoals Reservation Complex D Consolidation Project Population Data</b> |                   |                                |                             |                 |                         |
|--|-------------------|--------------------------------|-----------------------------|-----------------|-------------------------|
| <b>Geography</b>   | <b>Population</b> | <b>Population Demographics</b> |                             |                 |                         |
|  | <b>Total</b>      | <b>Non-minority</b>            | <b>Percent Non-minority</b> | <b>Minority</b> | <b>Percent Minority</b> |
| Alabama  | 5,074,296         | 3,501,264                      | 69%                         | 1,573,031       | 31%                     |
| Muscle Shoals Metro Area   | 17,019            | 13,785                         | 81%                         | 3,234           | 19%                     |
| Colbert County, Alabama  | 58,033            | 46,426                         | 80%                         | 11,606          | 20%                     |
| 1-Mile Radius - Project Site   | 595               | 524                            | 88%                         | 71              | 12%                     |

**Sources:** \*U.S. Census Bureau. American Fact Finder; 2020 ACS 5-year estimates. Accessed June 5, 2023. [www.census.gov/quickfacts/AL](http://www.census.gov/quickfacts/AL)

\*USEPA. EJSCREEN. Accessed June 5, 2023. Available at: <https://ejscreen.epa.gov/mapper/>

Recorded population within the one-mile radius is predominantly white, with 88 percent reporting race as white and 12 percent minority. The reported minority population within the one-mile radius is about 8 percentage points lower than the Colbert County minority population of 20 percent, which is less than Alabama's 31 percent minority population (Table 6).

Within one mile of the Project Area, a slightly lower per capita income, \$25,202, has been reported as compared to the Colbert County, AL per capita income of \$25,807. The low-income household rate is 14 percentage points greater within the one-mile radius of the Project Area when compared to the Colbert County, AL low-income rate of 35 (Table 7).

**Table 7. Project Site Income and Poverty**

| <b>Muscle Shoals Reservation Complex D Consolidation Project Income and Poverty Data</b> |                         |                          |                   |
|--|-------------------------|--------------------------|-------------------|
| <b>Geography</b>   | <b>Household Income</b> |                          |                   |
|  | <b>Total Households</b> | <b>Per Capita Income</b> | <b>Low Income</b> |
| Alabama  | 1,889,000               | \$30,458.00              | 36%               |
| Muscle Shoals-Sheffield Metro Area   | 9,626                   | \$26,810.00              | 32%               |
| Colbert County, Alabama  | 21,797                  | \$25,807.00              | 35%               |
| 1-Mile Radius - Project Site   | 254                     | \$25,202.00              | 49%               |

**Sources:** \*U.S. Census Bureau. American Fact Finder; 2020 ACS 5-year estimates. Accessed June 5, 2023. [www.census.gov/quickfacts/AL](http://www.census.gov/quickfacts/AL)

\*USEPA. EJSCREEN. Accessed June 5, 2023. Available at: <https://ejscreen.epa.gov/mapper/>

Under the preferred Action Alternative, the proposed facility consolidation would be constructed. Approximately 30 workers would be employed during construction, lasting approximately 10 - 18 months. Most of these workers would be based in the local area, leading to a short-term beneficial impact on the local economy. Operation of the facility would not result in an increase in local employment as additional workers are not expected to be needed for day-to-day operation of the consolidated facility. While periodic maintenance activities would be done by local workers, this would not result in an increase in employment. Although it is too early to quantify, the Proposed Action is not likely to change the local tax base through property taxes as a result of site improvements. Thus, no impacts to socioeconomics or environmental justice would occur from the proposed TVA facility modifications.

While there are only limited and short-term benefits to the labor force, the Proposed Action would not sustain better positions in Colbert County, AL and the State of Alabama in economic development ventures. When compared to state and county data, there is a slightly lower concentration of minority population near the Project. While there is what would potentially be considered a low-income population near the Project Area, the overall impacts of the facility consolidation, most of which would occur during the short construction period, would be minor. The off-site impacts to surrounding properties would also be negligible. The asbestos, construction, and demolition waste associated with the removal of the present buildings would be shipped to Republic's Morris Farms Landfill facility, located in Hillsboro, Alabama. The communities occurring along the proposed route of transport of these materials have been assessed and there are no disadvantaged communities within a 0.5-mile buffer of this travel corridor. Consequently, there would be no disproportionately adverse impacts to minority and low-income populations.

### **Cumulative Impacts**

The Council on Environmental Quality (CEQ) regulations define a cumulative impact as "the effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR § 1508.1). Cumulative impacts should be considered early in the project development process, as identification of potential cumulative impacts may assist in the design and

selection of alternatives and mitigation measures to minimize a project's environmental impacts.

As described above, the construction and operation of the MSR Complex D facility under the preferred Action Alternative would result in minor and temporary direct impacts to aquatic ecology, local water resources, visual resources, noise, air quality, and solid and hazardous waste. This proposed facility conversion would not impact the long-term function of the existing infrastructure, while allowing additional industrial development in the vicinity of the Project Area and improving overall work efficiency and space utilization.

### **Public Scoping and Review of the Draft EA**

A draft of the EA was released for public review and comment on September 6, 2023. The availability of the Draft EA and request for comments was announced in newspapers that serve the Colbert County area, and the Draft EA was posted on TVA's website. TVA's agency involvement included notification of the availability of the Draft EA to local, state, and federal agencies and federally recognized tribes.

Comments were accepted through October 6, 2023, via TVA's website, mail, and email. TVA received no comment letters from members of the public. This decision was based on the project purpose and need, anticipated environmental impacts as documented in the final EA, and cost, schedule, technological, and other considerations.

### **Mitigation**

TVA would implement operating permit requirements and the routine best management practices described in the EA to avoid or reduce minor adverse environmental effects from the demolition, construction, and relocation of facility buildings. Additionally, TVA has committed to winter tree removal (November 15 - March 15) in order to avoid any potential impacts to threatened and endangered bat species that may be present on-site. Standard construction and demolition waste materials from the building demolition would be transported offsite to an approved local Construction and Debris (C&D) landfill. Special waste, such as asbestos waste, would be transported to the Morris Farms facility in Hillsboro, AL or another permitted landfill. All asphalt, soils and rock excavated at the site will remain within the Project Area for use or will be shipped offsite for disposal at the Morris Farms Facility or equivalent approved facility. Additionally, prior to the start of disturbance, TVA will obtain a Construction Stormwater Permit, submit a 10-working day notification to ADEM for demolition and notify ADEM in advance that there will be work occurring that has the potential to impact a SWMU.

### **Conclusion and Findings**

Based on the findings in this EA, TVA concludes that the Proposed Action to consolidate the operational buildings at the MSR Complex D would not be a major federal action significantly affecting the environment. Accordingly, a Finding of No Significant Impact (FONSI) is appropriate, and an environmental impact statement is not required.

### **Agencies and Others Consulted**

- Alabama State Historic Preservation Office
- Shawnee Tribe of Indians of Oklahoma
- Alabama-Coushatta Tribe of Texas
- Cherokee Nation
- The Chickasaw Nation

- Coushatta Tribe of Louisiana
- Eastern Band of Cherokee Indians
- Eastern Shawnee Tribe of Oklahoma
- Jena Band of Choctaw Indians
- Kialegee Tribal Town
- Mississippi Band of Choctaw Indians
- The Muscogee (Creek) Nation
- Poarch Band of Creek Indians
- The Seminole Nation of Oklahoma
- Shawnee Tribe
- Thlopthlocco Tribal Town
- United Keetoowah Band of Cherokee Indians in Oklahoma

### **Permits, Licenses, and Approvals**

- Alabama Department of Environmental Management (ADEM) General National Pollutant Discharge Elimination System (NPDES) Permit for stormwater discharge associated with construction activity.
- ADEM Construction Best Management Practices Plan to outline effective erosion and sediment controls for the General NPDES Permit.
- Potential modification of the existing NPDES Permit ALG140643 to address changes in surface water discharges resulting from the construction of the new facility.
- 10 working day notification to the Air Division of ADEM for Asbestos Abatement and/or Demolition (form 496 latest version)
- Notification to ADEM of planned alterations to the area covered by the Alabama Hazardous Wastes Management and Minimization Act (AHWMMA) permit (U.S. Environmental Protection Agency [USEPA] ID # AL3 640 090 005) for the former TVA Environmental Research Center Area.

## **TVA Preparers**

### **Neil Schock, NEPA Specialist – NEPA Compliance and Document Preparation**

Education: M.S. Ecology; B.S. Biology  
Project Role: TVA NEPA Specialist  
Experience: 14 years of experience in water quality monitoring, permit writing, project management and NEPA compliance.

### **J. Taylor Johnson, NEPA Specialist – NEPA Compliance and Document Preparation**

Education: M.S. Environmental Science; B.S. Biochemistry  
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Experience: 5 years of experience in NEPA compliance and Project Management.

### **Carrie Williamson, Flood Risk Program Manager – Floodplains and Flood Risk**

Education: M.S., Civil Engineering; B.S., Civil Engineering; Professional Engineer (Tennessee), Certified Floodplain Manager  
Project Role: Floodplains and Flood Risk Subject Matter Expert  
Experience: 10 years in Floodplains and Flood Risk; 3 years in River Forecasting; 11 years in Compliance Monitoring.

### **Stacey McCluskey, Environmental Program Manager – Document Preparation**

Education: M.S., Civil Engineering, B.S., Chemical Engineering  
Project Role: TVA Program Manager  
Experience: 31 years environmental experience, with emphasis on project management, permit writing, regulation interpretation and waste management.

### **Matthew Reed, Aquatic Ecologist – Field Survey and Document Preparation**

Education: M.S. Wildlife and Fisheries Science; QHP  
Project Role: Aquatic Ecology, Aquatic T&E Species Subject Matter Expert  
Experience: 13 years working with threatened and endangered aquatic species in the Southeastern United States; 7 years in ESA, NEPA, and CWA compliance and stream assessments.

### **David Mitchell, Botanist – Field Survey and Document Preparation**

Education: M.S. Soil and Water Science, B.S. Horticulture  
Project Role: Vegetation, Threatened and Endangered Plants Subject Matter Expert  
Experience: 18 years of expertise with botany, ecosystem restoration, land management; 6 years of project/program management in environmental research.

### **Chloe Sweda, Natural Areas Biologist – Site Investigation and Document Preparation**

Education: B.S. Earth and Environmental Sciences  
Project Role: Natural Area Subject Matter Expert  
Experience: 5.5 years in Natural Resource Management.

### **Elizabeth Hamrick, Terrestrial Zoologist – Field Survey and Document Preparation**

Education: M.S. Wildlife and Fisheries Science, B.A. Biology, B.A. Anthropology

Project Role: Terrestrial Zoology Subject Matter Expert

Experience: 19 years working in wildlife biology, threatened and endangered species surveys, research, and habitat restoration, 14 years technical writing, 10 years compliance with NEPA and ESA.

**Fallon Parker Hutcheon, Wetland Biologist – Field Survey and Document Preparation**

Education: M.S. Environmental Studies and B.S. Biology

Project Role: Wetland Subject Matter Expert

Experience: 4 years in wetland delineation, wetland impact analysis, and NEPA and CWA compliance.

**Steve Cole, Archaeologist – Field Survey and Document Preparation**

Education: M.A., Ph.D. Anthropology

Project Role: Archaeologist

Experience: Teaching: 3 years; Museum: 1 year; Contract Archaeology: 5 1/2 years; TVA staff aug contractor: 9 1/2 years; TVA Archaeologist: 5 years

**Sara Bayles Dollar, Recreational Specialist – Site Review and Document Preparation**

Education: M.S. Sport and Recreation Management

Project Role: TVA Watershed Representative

Experience: 3 years of experience in outdoor recreation management.

**Craig Phillips, Specialist – Water Permits, Compliance, & Monitoring – Document Review**

Education: M.S. Wildlife & Fisheries Science; B.S. Wildlife & Fisheries Science

Project Role: TVA Water Permitting Specialist

Experience: 1 year of experience in water permitting. 15 years of experience in aquatic ecology/ T&E and NEPA compliance.

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**Appendix A: Stream crossings along the proposed TVA Muscle Shoals Reservation Complex D Consolidation EA in Colbert County, Alabama (TVA Project No. 543440).**

| Sequence ID | Stream ID | Stream Type                                     | Streamside Management Zone Category | Stream Name                              | Field Notes  | Coward in Code | HGM Code | Latitude    | Longitude    |
|-------------|-----------|---|-------------------------------------|--|--|----------------|----------|-------------|--------------|
| S001        | Asz 003   | Intermittent Stream                             | Category A (50ft)                   | Unnamed tributary to the Tennessee River | 3' x 1'. Moist soil, isolated pools. Clay and gravel substrate | R4             | Riverine | 34.77587692 | -87.6581111  |
| E001        | Asz 001   | Wet Weather Conveyance (WWC) / Ephemeral Stream | Best Management Practices           | Unnamed tributary to the Tennessee River | 2' x 1' DATOS  | R6             | Riverine | 34.77678554 | -87.65669222 |
| E002        | Asz 002   | Wet Weather Conveyance (WWC) / Ephemeral Stream | Best Management Practices           | Unnamed tributary to the Tennessee River | 2' x 1' DATOS  | R6             | Riverine | 34.77640979 | -87.65732598 |
| E003        | Asz 001   | Wet Weather Conveyance (WWC) / Ephemeral Stream | Best Management Practices           | Unnamed tributary to the Tennessee River | 2'x1', no flow, isolated pools of water, weak sinuosity        | R6             | Riverine | 34.77588235 | -87.65852902 |
| E004        | Asz 001   | Wet Weather Conveyance (WWC) / Ephemeral Stream | Best Management Practices           | Unnamed tributary to the Tennessee River | 1' x 1' DATOS  | R6             | Riverine | 34.77625373 | -87.65800353 |

|      |            |   |                                     |   |               |    |              |                 |                      |
|------|------------|---|-------------------------------------|---|---------------|----|--------------|-----------------|----------------------|
|      |            | ral<br>Stream   |                                     |   |               |    |              |                 |                      |
| E005 | Asz<br>001 | Wet<br>Weathe<br>r<br>Convey<br>ance<br>(WWC)<br>/<br>Epheme<br>ral<br>Stream | Best<br>Manageme<br>nt<br>Practices | Unnam<br>ed<br>tributar<br>y to the<br>Tennes<br>see<br>River | 1' x 1' DATOS | R6 | Riveri<br>ne | 34.7764<br>0816 | -<br>87.6578<br>9927 |
| E006 | Asz<br>001 | Wet<br>Weathe<br>r<br>Convey<br>ance<br>(WWC)<br>/<br>Epheme<br>ral<br>Stream | Best<br>Manageme<br>nt<br>Practices | Unnam<br>ed<br>tributar<br>y to the<br>Tennes<br>see<br>River | 1' x 1' DATOS | R6 | Riveri<br>ne | 34.7755<br>9111 | -<br>87.6589<br>7564 |
| E007 | Asz<br>001 | Wet<br>Weathe<br>r<br>Convey<br>ance<br>(WWC)<br>/<br>Epheme<br>ral<br>Stream | Best<br>Manageme<br>nt<br>Practices | Unnam<br>ed<br>tributar<br>y to the<br>Tennes<br>see<br>River | 1' x 1' DATOS | R6 | Riveri<br>ne | 34.7758<br>6987 | -<br>87.6598<br>4184 |
| E008 | Asz<br>001 | Wet<br>Weathe<br>r<br>Convey<br>ance<br>(WWC)<br>/<br>Epheme<br>ral<br>Stream | Best<br>Manageme<br>nt<br>Practices | Unnam<br>ed<br>tributar<br>y to the<br>Tennes<br>see<br>River | 1' x 1' DATOS | R6 | Riveri<br>ne | 34.7765<br>7334 | -<br>87.6600<br>9834 |
| E009 | Asz<br>001 | Wet<br>Weathe<br>r<br>Convey<br>ance<br>(WWC)<br>/<br>Epheme<br>ral<br>Stream | Best<br>Manageme<br>nt<br>Practices | Unnam<br>ed<br>tributar<br>y to the<br>Tennes<br>see<br>River | 1' x 1' DATOS | R6 | Riveri<br>ne | 34.7768<br>3054 | -<br>87.6601<br>2282 |

|      |            |   |                                     |   |               |    |              |                 |                      |
|------|------------|---|-------------------------------------|---|---------------|----|--------------|-----------------|----------------------|
| E010 | Asz<br>001 | Wet<br>Weathe<br>r<br>Convey<br>ance<br>(WWC)<br>/<br>Epheme<br>ral<br>Stream | Best<br>Manageme<br>nt<br>Practices | Unnam<br>ed<br>tributar<br>y to the<br>Tennes<br>see<br>River | 1' x 1' DATOS | R6 | Riveri<br>ne | 34.7777<br>7835 | -<br>87.6605<br>7707 |
| E011 | Asz<br>001 | Wet<br>Weathe<br>r<br>Convey<br>ance<br>(WWC)<br>/<br>Epheme<br>ral<br>Stream | Best<br>Manageme<br>nt<br>Practices | Unnam<br>ed<br>tributar<br>y to the<br>Tennes<br>see<br>River | 1' x 1' DATOS | R6 | Riveri<br>ne | 34.7788<br>6583 | -<br>87.6581<br>5623 |



## Appendix B: Project Review Form – TVA Bat Strategy, Muscle Shoals Reservation Complex D Consolidation EA in Colbert County, Alabama.

### Project Review Form - TVA Bat Strategy (06/2019)

This form should **only** be completed if project includes activities in Tables 2 or 3 (STEP 2 below). This form activities are limited to Table 1 (STEP 2) or otherwise determined to have no effect on federally listed bats: statement in your environmental compliance document (e.g., add as a comment in the project CEC): "Project Strategy Table 1 or otherwise determined to have no effect on federally listed bats. Bat Strategy Project Review Form This form is to assist in determining required conservation measures per TVA's ESA Section 7 programmatic actions and federally listed bats.<sup>1</sup>

**Project Name:** TVA MSR Complex D Consolidation EA **Date:**

**Contact(s):** Stacey McCluskey **CEC#:**

**Project Location (City, County, State):** Colbert County, Alabama - Muscle Shoals Reservation

**Project Description:**

Modernize and consolidate structures at the Complex D facility. Will include demolition, construction and a rework of the layout of buildings along with new lighting and access control.

#### SECTION 1: PROJECT INFORMATION - ACTION AND ACTIVITIES

**STEP 1) Select TVA Action. If none are applicable, contact environmental support staff, Environmental Zoologist to discuss whether form (i.e., application of Bat Programmatic Consultation) is appropriate.**

- |   |   |
|---|---|
| <input type="checkbox"/> 1 Manage Biological Resources for Biodiversity and Public Use on TVA Reservoir Lands | <input type="checkbox"/> 6 Maintain Existing Electric Transmission      |
| <input type="checkbox"/> 2 Protect Cultural Resources on TVA-Retained Land                                    | <input type="checkbox"/> 7 Convey Property associated with Transmission |
| <input type="checkbox"/> 3 Manage Land Use and Disposal of TVA-Retained Land                                  | <input type="checkbox"/> 8 Expand or Construct New Assets               |
| <input type="checkbox"/> 4 Manage Permitting under Section 26a of the TVA Act                                 | <input type="checkbox"/> 9 Promote Economic Development                 |
| <input checked="" type="checkbox"/> 5 Operate, Maintain, Retire, Expand, Construct Power Plants               | <input type="checkbox"/> 10 Promote Mid-Scale Solar                     |

**STEP 2) Select all activities from Tables 1, 2, and 3 below that are included in the proposed project.**

**TABLE 1. Activities with no effect to bats. Conservation measures & completion of bat strategy project required.**

|   |   |   |
|---|---|---|
| <input type="checkbox"/> 1. Loans and/or grant awards | <input type="checkbox"/> 8. Sale of TVA property  | <input type="checkbox"/> 19. Site-specific and research |
| <input type="checkbox"/> 2. Purchase of property      | <input type="checkbox"/> 9. Lease of TVA property | <input type="checkbox"/> 20. Nesting habitat            |

## Project Review Form - TVA Bat Strategy (06/2019)

**TABLE 2. Activities not likely to adversely affect bats with implementation of conservation measures. Completion of bat strategy project review form REQUIRED; review of bat records in proximity to project REQUIRED.**

|  |  |   |
|--|--|---|
| <input checked="" type="checkbox"/> 18. Erosion control, minor                 | <input type="checkbox"/> 57. Water intake - non-industrial                   | <input type="checkbox"/> 79. Swimming             |
| <input type="checkbox"/> 24. Tree planting                                     | <input type="checkbox"/> 58. Wastewater outfalls                             | <input type="checkbox"/> 81. Water in             |
| <input type="checkbox"/> 30. Dredging and excavation; recessed harbor areas    | <input type="checkbox"/> 59. Marine fueling facilities                       | <input checked="" type="checkbox"/> 84. On-site/c |
| <input type="checkbox"/> 39. Berm development                                  | <input type="checkbox"/> 60. Commercial water-use facilities (e.g., marinas) | <input type="checkbox"/> 85. Playgrou             |
| <input type="checkbox"/> 40. Closed loop heat exchangers (heat pumps)          | <input type="checkbox"/> 61. Septic fields                                   | <input type="checkbox"/> 87. Abovegr              |
| <input type="checkbox"/> 45. Stream monitoring equipment - placement and use   | <input type="checkbox"/> 66. Private, residential docks, piers, boathouses   | <input type="checkbox"/> 88. Undergr              |
| <input type="checkbox"/> 46. Floating boat slips within approved harbor limits | <input type="checkbox"/> 67. Siting of temporary office trailers             | <input type="checkbox"/> 90. Pond clo             |
| <input checked="" type="checkbox"/> 48. Laydown areas                          | <input type="checkbox"/> 68. Financing for speculative building construction | <input type="checkbox"/> 93. Standard             |
| <input type="checkbox"/> 50. Minor land based structures                       | <input type="checkbox"/> 72. Ferry landings/service operations               | <input type="checkbox"/> 94. Special U            |
| <input type="checkbox"/> 51. Signage installation                              | <input type="checkbox"/> 74. Recreational vehicle campsites                  | <input type="checkbox"/> 95. Recreati             |
| <input type="checkbox"/> 53. Mooring buoys or posts                            | <input type="checkbox"/> 75. Utility lines/light poles                       | <input type="checkbox"/> 96. Land Use             |
| <input type="checkbox"/> 56. Culverts  | <input checked="" type="checkbox"/> 76. Concrete sidewalks                   |   |

**Table 3: Activities that may adversely affect federally listed bats. Conservation measures AND completion of bat strategy project review form REQUIRED; review of bat records in proximity of project REQUIRED by OSAR/Heritage eM. Zoologist.**

|  |   |   |
|--|---|---|
| <input type="checkbox"/> 15. Windshield and ground surveys for archaeological resources  | <input checked="" type="checkbox"/> 34. Mechanical vegetation removal, includes trees or tree branches > 3 inches in diameter | <input checked="" type="checkbox"/> 69. |
| <input type="checkbox"/> 16. Drilling  | <input type="checkbox"/> 35. Stabilization (major erosion control)  | <input type="checkbox"/> 70.            |
| <input type="checkbox"/> 17. Mechanical vegetation removal, does not include trees or branches > 3" in diameter (in Table 3 due to potential for woody burn piles) | <input type="checkbox"/> 36. Grading  | <input type="checkbox"/> 71.            |
| <input type="checkbox"/> 21. Herbicide use   | <input type="checkbox"/> 37. Installation of soil improvements  | <input type="checkbox"/> 73.            |
| <input type="checkbox"/> 22. Grubbing  | <input type="checkbox"/> 38. Drain installations for ponds  | <input type="checkbox"/> 77.            |
| <input type="checkbox"/> 23. Prescribed burns  | <input type="checkbox"/> 47. Conduit installation   | <input type="checkbox"/> 78.            |
| <input checked="" type="checkbox"/> 25. Maintenance, improvement or construction of pedestrian or vehicular access corridors                                       | <input type="checkbox"/> 52. Floating buildings   | <input type="checkbox"/> 80.            |
| <input checked="" type="checkbox"/> 26. Maintenance/construction of access control measures  | <input type="checkbox"/> 54. Maintenance of water control structures (dewatering units, spillways, levees)                    | <input type="checkbox"/> 82.            |
| <input type="checkbox"/> 27. Restoration of sites following human use and abuse  | <input type="checkbox"/> 55. Solar panels   | <input type="checkbox"/> 83.            |

## Project Review Form - TVA Bat Strategy (06/2019)

**STEP 4) Answer questions a through e below (applies to projects with activities from Table 3 ONL**

a) Will project involve continuous noise (i.e.,  $\geq 24$  hrs) that is greater than 75 decibels measured on the A scale (e.g., loud machinery)? ☒ **NO** (NV2 does not apply) ☐ **YES** (NV2 applies, see records)

b) Will project involve entry into/survey of cave? ☒ **NO** (HP1/HP2 do not apply) ☐ **YES** (HP1/HP2 apply, see records)

c) If conducting **prescribed burning (activity 23)**, estimated acreage:  and timeframe

| STATE      | SWARMING                                 | WINTER                                   | NON-WINTER  |                              |
|------------|--|--|---|------------------------------|
| GA, KY, TN | <input type="checkbox"/> Oct 15 - Nov 14 | <input type="checkbox"/> Nov 15 - Mar 31 | <input type="checkbox"/> Apr 1 - May 31, Aug 1 - Oct 14   | <input type="checkbox"/> Jur |
| VA         | <input type="checkbox"/> Sep 16 - Nov 15 | <input type="checkbox"/> Nov 16 - Apr 14 | <input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 15 | <input type="checkbox"/> Jur |
| AL         | <input type="checkbox"/> Oct 15 - Nov 14 | <input type="checkbox"/> Nov 15 - Mar 15 | <input type="checkbox"/> Mar 16 - May 31, Aug 1 - Oct 14  | <input type="checkbox"/> Jur |
| NC         | <input type="checkbox"/> Oct 15 - Nov 14 | <input type="checkbox"/> Nov 15 - Apr 15 | <input type="checkbox"/> Apr 16 - May 31, Aug 1 - Oct 14  | <input type="checkbox"/> Jur |
| MS         | <input type="checkbox"/> Oct 1 - Nov 14  | <input type="checkbox"/> Nov 15 - Apr 14 | <input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 30 | <input type="checkbox"/> Jur |

d) Will the project involve vegetation piling/burning? ☒ **NO** (SSPC4/ SHF7/SHF8 do not apply) ☐ **YES** (SSPC4/SHF7/SHF8 applies, subject to review)

e) If **tree removal (activity 33 or 34)**, estimated amount:  ☐ ac ☒ **trees** ☐ N/A

| STATE      | SWARMING                                 | WINTER  | NON-WINTER  |                              |
|------------|--|---|---|------------------------------|
| GA, KY, TN | <input type="checkbox"/> Oct 15 - Nov 14 | <input type="checkbox"/> Nov 15 - Mar 31            | <input type="checkbox"/> Apr 1 - May 31, Aug 1 - Oct 14   | <input type="checkbox"/> Jur |
| VA         | <input type="checkbox"/> Sep 16 - Nov 15 | <input type="checkbox"/> Nov 16 - Apr 14            | <input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 15 | <input type="checkbox"/> Jur |
| AL         | <input type="checkbox"/> Oct 15 - Nov 14 | <input checked="" type="checkbox"/> Nov 15 - Mar 15 | <input type="checkbox"/> Mar 16 - May 31, Aug 1 - Oct 14  | <input type="checkbox"/> Jur |
| NC         | <input type="checkbox"/> Oct 15 - Nov 14 | <input type="checkbox"/> Nov 15 - Apr 15            | <input type="checkbox"/> Apr 16 - May 31, Aug 1 - Oct 14  | <input type="checkbox"/> Jur |
| MS         | <input type="checkbox"/> Oct 1 - Nov 14  | <input type="checkbox"/> Nov 15 - Apr 14            | <input type="checkbox"/> Apr 15 - May 31, Aug 1 - Sept 30 | <input type="checkbox"/> Jur |

If warranted, does project have flexibility for bat surveys (May 15-Aug 15): ☒ **MAYBE** ☐ **YES**

\*\*\* For **PROJECT LEADS** whose projects will be reviewed by a Heritage Reviewer (Natural Resources Organization or Save As, name form as "ProjectLead\_BatForm\_CEC-or-ProjectIDNo\_Date", and submit with project information. Ot

**SECTION 2: REVIEW OF BAT RECORDS (applies to projects with activities from Table 3 ONLY)****STEP 5) Review of bat/cave records conducted by Heritage/OSAR reviewer?**

☒ **YES** ☐ **NO** (Go to Step 13)

Info below completed by: ☐ **Heritage Reviewer** (name)   
☐ **OSAR Reviewer** (name)   
☐ **Terrestrial Zoologist** (name)

**Project Review Form - TVA Bat Strategy (06/2019)**

**STEP 6) Provide any additional notes resulting from Heritage Reviewer records review in Notes below**  
 .....

**Notes from Bat Records Review** (e.g., historic record; bats not on landscape during action; DOT bridge survey)

**STEPS 7-12 To be Completed by Terrestrial Zoologist (if warranted):**

**STEP 7) Project will involve:**

- ☐ Removal of suitable trees within 0.5 mile of P1-P2 Indiana bat hibernacula or 0.25 mile of P3-P4 Indiana NLEB hibernacula.
- ☐ Removal of suitable trees within 10 miles of documented Indiana bat (or within 5 miles of NLEB) hibernacula.
- ☒ Removal of suitable trees > 10 miles from documented Indiana bat (> 5 miles from NLEB) hibernacula.
- ☐ Removal of trees within 150 feet of a documented Indiana bat or northern long-eared bat maternity roost.
- ☐ Removal of suitable trees within 2.5 miles of Indiana bat roost trees or within 5 miles of Indiana bat capture site.
- ☒ Removal of suitable trees > 2.5 miles from Indiana bat roost trees or > 5 miles from Indiana bat capture site.
- ☐ Removal of documented Indiana bat or NLEB roost tree, if still suitable.
- ☐ N/A

**STEP 8) Presence/absence surveys were/will be conducted:** ☐ YES ☒ NO ☐ TBD

**STEP 9) Presence/absence survey results, on**  ☐ NEGATIVE ☐ POSITIVE ☒ N/A

**STEP 10) Project** ☒ WILL ☐ WILL NOT **require use of Incidental Take in the amount of**  0.36 **proposed to be used during the** ☐ WINTER ☐ VOLANT SEASON ☐ NON-VOLANT SEASON ☐ N/A

**STEP 11) Available Incidental Take (prior to accounting for this project) as of**  May 23, 2023

| TVA Action  | Total 20-year | Winter | Volant Season |
|---|---------------|--------|---------------|
| 5 Operate, Maintain, Retire, Expand, Construct Power Plants | 746.83        | 560.99 | 185.84        |

**STEP 12) Amount contributed to TVA's Bat Conservation Fund upon activity completion:** \$  0

**TERRESTRIAL ZOOLOGISTS, after completing SECTION 2, review Table 4, modify as needed, and then complete this section. Terrestrial Zoologists at end of form.**

**SECTION 3: REQUIRED CONSERVATION MEASURES**

**STEP 13) Review Conservation Measures in Table 4 and ensure those selected are relevant to the project.**

## Project Review Form - TVA Bat Strategy (06/2019)

**Table 4. TVA's ESA Section 7 Programmatic Bat Consultation Required Conservation Measures**

The Conservation Measures in Table 4 are automatically selected based on your choices in Tables 2 and 3 but can be manually overridden, if necessary. To Manually override, press the button and enter your name.



**Name:** Elizabeth Hamrick

| Check if Applies to Project | Activities Subject To Conservation Measure | Conservation Measure Description  |
|-----------------------------|--|---|
|                             |  | <p><b>NV1</b> - Noise will be short-term, transient, and not significantly different from urban (thunderstorms) that bats are frequently exposed to when present on the landscape.</p>  |
|                             |  | <p><b>TR4*</b> - Removal of suitable summer roosting habitat within potential habitat for Ind bat will be tracked, documented, and included in annual reporting. Project will then of tree removal to appropriate TVA staff.</p>  |
|                             |  | <p><b>SSPC2</b> - Operations involving chemical/fuel storage or resupply and vehicle service in riparian zones (streamside management zones) in a manner to prevent these items from entering riparian zones. Earthen berms or other effective means are installed to protect stream channel from erosion. All work will be done with care to avoid leakage, spillage, and subsequent stream, wetland, or riparian zone impacts. Oil waste, filters, other litter will be collected and disposed of properly. Equipment storage will be limited to locations greater than 300-ft from sinkholes, fissures, or other karst features.</p> |